

#116 • \$3.00
**Useful Tips &
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Superior quality starts here...

1-800-722-2720 • 850-455-5476



The Starting & Charging Specialists

1



1 It all starts coming together here. An automated line dispenses epoxy glue on the inside of the shell; high performance magnets are bonded through an induction heating procedure. Buffer pads are then added.

2 At this induction heating station the corrosion resistant nickel-plated armature shaft, ring and silicon steel lamination stack are joined as one unit.



2



3



3 Next stop is the powder coater. The best insulation and corrosion preventative available.

4



4 A number of steps are completed within this station. Here, the commutator is attached, a computerized armature winder adds the copper wire, and commutator clamps are crimped and silver welded. Next, the armature will go into a lathe where the commutator will be polished. Two computerized quality checks are made during this time.

5



5 The armatures are now placed on the automated assembly line. A robotic arm picks up each armature and places it into the trickle varnish "carousel." When this step is complete, the same robotic arm removes the armature and places it back on the line.

6



6 Add the brush kit, nuts, bolts, spring, end cap and drive gear. Assembly of the starter is almost complete at this phase of the line.

7 The final of many tests! Each and every starter must pass multi-level, maximum load test before being boxed. Quality assured all the way!

7





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ARCO is a full service supplier of new and remanufactured electrical products for the starting and charging of marine engines. Located in the United States, **ARCO** has operated in Pensacola, Florida since 1960.

ARCO sells only original equipment quality items! All new and remanufactured units are assembled under the strictest quality control standards. **Each** and **every** unit is tested on the assembly line to ensure original equipment reliability.

ARCO products are distributed to thousands of dealers through a network of 180 national and international warehouse distributors worldwide.

ARCO stocks thousands of complete units and replacement parts to service everything from bass boats to battleships.

ARCO services all D.C. voltage systems, including clockwise and counterclockwise rotation starting motors.

ARCO catalogs only the items most frequently requested by our customers worldwide.

ARCO also supplies replacement parts for many "hard-to-find" and "obsolete" units from our constantly expanding inventory.



HOURS OF OPERATION

MONDAY – THURSDAY

7:00 A.M. - 5:30 P.M. CENTRAL

CLOSED FRIDAYS

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POLICIES



PAYMENT POLICY



ARCO accepts the following major credit cards: MasterCard, Visa, American Express, and Discover. Credit card orders will be shipped immediately. **All shipments are processed by credit card only.**

SHIPPING

MONDAY - THURSDAY - CLOSED FRIDAYS

MINIMUM ORDER: \$50.00 (U.S. currency only). Please add 15% for Parcel Post. We are proud of our prompt, efficient service. 99.8% of all orders are shipped within 24 hours of placement. Shipments of 150 lbs or less are shipped via UPS or FedEx. Larger orders are shipped freight collect. All orders are shipped F.O.B. shipping point.

PRIORITY SHIPPING: Next day, second day, air, and air freight shipments are subject to an additional \$5 handling charge. Priority shipments will be hand-carried through the order process. **All orders received before 2:30 P.M. CST (M-TH) will be shipped the same day.**

DROP SHIPPING: Unless a duplicate order is placed for inventory, a 10% surcharge will be added for all drop shipments.

WARRANTY

ARCO products, when properly installed, are warranted by ARCO against defects in materials and workmanship for a period of **12 MONTHS FOR LEISURE USE**. Products used in commercial or racing applications are warranted for a period of 90 days.

This warranty extends to the application under normal use and service and **does not apply to rust, corrosion, submersions, cut wires, deliberate abuse, burnouts, broken drive gears, internal gears or housings.**

Improper installation, careless handling, tampering or dismantling of units makes this warranty null and void.

**Our warranty is limited to repair or replacement of the defective unit.
It does not cover labor or any other expense.**

This warranty being expressly in lieu of all other obligations or liabilities and ARCO neither assumes nor authorizes any other person or firm to assume for it any other liability in

NOTE

Our warranty is limited to the repair or replacement of defective units only.

Labor or any other expenses are NOT covered.

All warranty returns must have a RETURN GOODS AUTHORIZATION NUMBER and include a complete explanation of malfunction.

RETURNS

LOST OR DAMAGED GOODS: Our responsibility ceases when the transportation company signs the bill of lading signifying your merchandise has been picked up in good condition. If part of your shipment is lost or damaged, do not accept shipment until the freight agent makes a notation on your freight bill.

THOROUGHLY INSPECT YOUR SHIPMENT AS SOON AS IT IS RECEIVED. If any concealed loss or damage is discovered, it is absolutely necessary for you to request an inspection by your freight agent. We are willing to give our assistance in collecting claims for loss or damage; however, we cannot be responsible for claims collection or replacement of damaged goods.

STOCK ADJUSTMENT:

All returns must be pre-approved and are subject to a 15% handling charge or an offsetting order of twice the equivalent value. Merchandise must be returned freight prepaid in original packaging and in saleable condition. **Dirty or damaged packaging will be replaced and charged to the customer's account.**

WARRANTY RETURNS:

All returns must be pre-approved and returned FREIGHT PREPAID. Warranty returns must include a complete explanation. Return warranty units for evaluation to:
ARCO Starting and Charging
3921 Navy Boulevard
Pensacola, FL 32507-1296 U.S.A.

PACKAGING:

All returned items must be packaged with due care in the original ARCO box(es). A copy of the original ARCO invoice and the returning company's packing list must be included. The packing list should show the ARCO part number(s) returned. **All warranty returns must include a complete explanation of the problem.**



An ARCO Warranty Protects You From Defects in MATERIALS OR WORKMANSHIP... The Warranty **DOES NOT** cover such things as:

FREIGHT DAMAGE



ARCO part boxes are not shipping boxes.

If you are shipping a part to a customer or sending a warranty return, the part must be packaged in a way to prevent possible damage. Place extra packing material around the part, place it back in the part box and then into a well packed, sturdy shipping container.

To prevent damage, properly pack all parts before reshipment.



BROKEN SOLENOIDS

The solenoid was not broken when the starter was packaged to be shipped. We have special boxes made for the starters, and we use special packing materials to ensure the item will arrive to the customer safely. Sometimes, though, the packages are mishandled by the carrier (i.e., dropped or thrown) and the solenoid becomes damaged. This is the carrier's responsibility. It is not a material defect; therefore it is **not covered by warranty**.



RUST, CORROSION OR SUBMERSIONS

ARCO treats every component with a special rust and corrosion resistant coating to prevent water damage. However, it is impossible to protect the unit from direct contact with water. Therefore, a failure directly caused by rust, corrosion or submersion is **not covered by warranty**.

BROKEN MOUNTING FLANGES OR SHAFTS

A broken flange is typically caused by improper installation. The mounting holes may look evenly spaced in a triangular pattern, but they are not—one hole is slightly offset. Forcing a mounting bolt into the offset hole may cause the flange to break. This may also occur if the mounting bolts are not tightened evenly. A broken shaft is caused by a malfunction in the gearbox. These breaks are not material defects, and they are **not covered by warranty**.



CUT WIRES OR DISMANTLED UNITS

Cutting a unit's wires or dismantling a unit immediately voids the manufacturer's warranty. In addition, taking a motor off the reservoir and trying to install it on an old reservoir usually damages the brushes and seals in the motor. Disassembled parts are **not covered by warranty**.

BROKEN NOSE HOUSINGS, DRIVE GEARS OR INTERNAL GEARS

This type of failure is always blamed on a bad casting, defective drive gear or internal gears. In fact, it is caused when a starter, spinning at a high rate of rpm, comes to an abrupt stop. This can occur when an engine backfires or momentarily releasing the start switch and re-engaging the starter before it has spun down. It may also happen when a cylinder suffers a water hydraulic lock. In either case, the damage is not due to a defective part, and is **not covered by warranty**.



PART NUMBER QUICK REFERENCE



Need Technical Assistance? Call Us at 1-850-455-5476 or Toll Free: 1-800-722-2720

CHRIS CRAFT

| | |
|-------------|-------|
| 16.60-00031 | VR407 |
| 16.61-00026 | 40115 |
| 16.61-00042 | 50142 |
| 16.61-00043 | 50141 |
| 16.61-00044 | 50160 |
| 16.61-00045 | 50161 |
| 16.61-00048 | 50141 |
| 16.61-00050 | 50160 |
| 16.61-00051 | 50161 |
| 16.61-00053 | VR406 |

CHRYSLER

| | |
|----------|-------|
| 177917 | SW774 |
| 2095509 | 50110 |
| 2098300 | VR405 |
| 2847527 | VR405 |
| 2855927 | 50110 |
| 2875927 | 50110 |
| 2875928 | 50109 |
| 3527501 | 40112 |
| 3527502 | 40112 |
| 449541-1 | 6216 |
| 455541 | 6216 |
| 460917-1 | SW295 |
| 480955 | 5393 |
| 490955 | 5393 |
| 575955 | 5382 |
| F6169551 | 5393 |

CRUSADER

| | |
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| 22611 | SW295 |
| 39049 | 60104 |
| 39064 | 60104 |
| 39200 | 60075 |
| 42016 | SW975 |
| 42090 | 30456 |
| 42091 | 30457 |
| 42150 | 30457 |
| 9006320 | SW774 |
| RU0050 | SW456 |
| RU0050A | SW463 |
| RU0050B | SW463 |
| R130014 | SW295 |

DELCO

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| 8400027 | 20822 |
| 8600514 | 20850 |
| 8600515 | 20840 |
| 8000500 | 5400 |
| 9000735 | 30470 & MBK450 |
| 9000762 | 30470 & MBK450 |
| 9000763 | 30460 |
| 9000768 | 30470 & MBK450 |
| 9000789 | 30470 & MBK450 |
| 9000819 | 30470 & MBK450 |
| 9000820 | 30460 |
| 9000821 | 30470 & MBK450 |

DELCO

| | |
|-------------|----------------|
| 9000822 | 30460 |
| 9000839 | 30470 & MBK450 |
| 9000840 | 30470 & MBK450 |
| 9000849 | 30470 & MBK450 |
| 9000884 S/P | 30433 |
| 9000884 H/P | 30470 & MBK450 |
| 9000885 | 30470 & MBK450 |
| 9000887 | 30462 |
| 9000888 | 30459 |
| 9000940 | 30470 & MBK450 |
| 9000974 | 5400 |
| 19010612 | 30457 |
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| 19010617 | 30456 |
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| 19020601 | 20800 |
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| 19020707 | 20850 |

FORCE

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| 819222 | DV393 |
| 819479A1 | 6276 |
| 819480A1 | 6276 |
| 820595 | SR394 |
| 50-819085 | 5393 |
| 50-819968-1 | 7325 |
| 50-820193 | 5394 |
| 50-F616955-1 | 5393 |
| 827675A1 | 6255 |
| 87-F660917 | R040 |
| 89-F460917-1 | SW295 |
| F15189 | SR393 |
| F15190 | BK900 |
| F177917 | SW774 |
| F575955 | 5382 |
| F616955 | 5393 |

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| S106-07E | 3421 |
| S106-07F | 3421 |
| S108-80 | 3420 |
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HITACHI

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| 36120-ZY6-013 | 6235 |
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KAWASAKI

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| 13101-3703 | DV750 |
| 13101-3705 | DV750 |
| 13101-3706 | DV750 |
| 59051-3005 | DV440 |
| 59051-5007 | DV440 |

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| 25942 | 5374-6 |
| 32082 | SW082 |
| 32701 | 20102 |
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| 63292 | BK900 |
| 65057 | SW981 |
| 65057A1 | SW981 |





PART NUMBER QUICK REFERENCE

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| MERCURY | ARCO | MERCURY | ARCO | MERCURY | ARCO | MERCURY | ARCO |
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| 819222A1..... | DV393 | 50-29105..... | 5374X | 50-79821A2..... | 30460 | 50-853329T..... | 5400 |
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| 823653A5..... | 6270 | 50-32403..... | 5374-6 | | | | |
| 823653A9..... | 6270 | 50-32411..... | 5374X | | | | |



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| 50-853869T | 5393 |
| 50-854636T | 5365 |
| 50-856996T | 5381X |
| 50-859168T | 5359 |
| 50-859169T | 5364 |
| 50-859170T | 5365 |
| 50-859170T1 | 5365 |
| 50-859171T | 5362 |
| 50-859377T | 5360 |
| 50-863007A1 | 30433 |
| 50-864340A2 | 30470 & MBK450 |
| 50-86976 | 5381X |
| 50-881368T1 | 3432 |
| 50-881368T2 | 3432 |
| 50-884044T | 5360 |
| 50-884045T | 5365 |
| 50-884238T | 5380 |
| 50-888151T | 5364 |
| 50-888160T | 5365 |
| 50-888161T | 5360 |
| 50-892339T | 5400 |
| 50-892339T01 | 5400 |
| 50-893886T | 5364 |
| 50-893887T | 5365 |
| 50-893888T | 5360 |
| 50-893889T | 5367 |
| 50-893890T | 5396 |
| 50-893891T | 5375 |
| 50-893892T | 5392 |
| 50-893893 | 5380 |
| 50-898265001 | 5362 |
| 50-898265002 | 5393 |
| 50-898265003 | 7325 |
| 50-898265005 | 5379 |
| 50-898265006 | 5366 |
| 50-898265007 | 5385 |
| 50-898265008 | 5381 |
| 50-898265009 | 5395 |
| 50-898265010 | 5377 |
| 50-898265011 | 5382 |
| 50-898265012 | 5388 |
| 50-898265013 | 5381X |
| 50-90983A1 | 5367 |
| 50-90983T1 | 5367 |
| 50-92669M | 3424 |
| 50-96359M | 3420 |
| 50-97072M | 3424 |
| 50-97072T | 3424 |
| 50-97499A2 | 30456 |
| 50-97499A3 | 30456 |
| 50-97499R2 | 30456 |
| 50-97499R4 | 30456 |
| 50-97693M | 3420 |
| 50-99417A2 | 30460 |
| 50-99418A2 | 30470 & MBK450 |
| 50-99419A3 | 30457 |
| 86-865202T | R202 |
| 87-18211 | R211 |
| 87-61053 | SW275 |
| 87-803632T | SW295 |
| 89-15857 | SW275 |
| 89-18080 | SW984 |
| 89-F460917-1 | SW295 |

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| 89-F654924-1 | SW924 |
| 89-68258 | SW275 |
| 89-68258A4 | SW275 |
| 89-76416A1 | SW394 |
| 89-76545 | SW275 |
| 89-76545T | SW275 |
| 89-803629T | SW924 |
| 89-817109A1 | SW109 |
| 89-817109A2 | SW109 |
| 89-817109A3 | SW109 |
| 89-818864 | SW064 |
| 89-818864T | SW064 |
| 89-818997A1 | SW097 |
| 89-818997A2 | SW097 |
| 89-818997T1 | SW097 |
| 89-818998A1 | SW097 |
| 89-818998A2 | SW097 |
| 89-818999A1 | SW099 |
| 89-818999A2 | SW099 |
| 89-825096 | SW945 |
| 89-825096T | SW945 |
| 89-846070 | SW058 |
| H/D VERSION | SW058HD |
| 89-850187A1 | SW097 |
| 89-850187T1 | SW097 |
| 89-850188A1 | SW099 |
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| 89-850189 | SW054 |
| 89-850189T | SW054 |
| 89-850408 | SW456 |
| 89-853654A1 | SW275 |
| 89-889273 | SW924 |
| 89-889274 | SW925 |
| 89-91975 | SW054 |
| 89-94318 | SW058 |
| H/D VERSION | SW058HD |
| 89-96054 | SW054 |
| 89-96054T | SW054 |
| 89-96158 | SW058 |
| 89-96158T | SW058 |
| 392-2940 | TR217 |
| 392-8262 | TR217 |
| 392-9250 | TR217 |
| F391926 | PA924 |
| F391926-1 | PA924 |

B.R.P. - O.M.C.



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| 172588 | 6228 |
| 172853 | TR208 |
| 172869 | SW340 |
| 173692 | AR104 |
| 173944 | 6228 |
| 174942 | 5376 |
| 175019 | 5376 |
| 277628 | SW081 |
| 321648 | DV376 |
| 328381 | SR372 |
| 378444 | SW081 |
| 380095 | SW622 |
| 380361 | 6209 |
| 380973 | VR404 |

B.R.P. - O.M.C.



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|--------|--------|
| 381166 | 40152 |
| 381519 | 40152 |
| 381781 | 30460 |
| 382138 | 6209 |
| 382220 | 6209 |
| 383440 | VR404 |
| 383443 | 40152 |
| 383575 | 5372X |
| 383622 | SW622 |
| 383691 | 5370 |
| 384163 | 5371 |
| 384198 | 30460 |
| 384233 | 40152 |
| 384777 | 5370 |
| 384781 | DV371 |
| 384914 | 5372X |
| 385401 | 5376 |
| 385529 | 5372 |
| 385844 | SR371 |
| 385949 | DV372 |
| 385952 | BK900 |
| 386430 | 5369 |
| 386591 | 5376 |
| 386657 | 5370 |
| 387094 | 5373 |
| 387277 | 6206 |
| 387683 | DV373 |
| 387684 | 5371 |
| 387768 | SR376 |
| 388955 | AR103 |
| 389275 | 5371 |
| 389398 | SW622 |
| 389493 | SW622 |
| 389954 | 5372 |
| 390124 | AR103 |
| 391264 | 6220 |
| 391511 | 5387 |
| 391735 | 5370 |
| 392133 | 5376 |
| 393259 | 6220 |
| 393570 | 5386 |
| 393988 | 6220 |
| 394176 | 6220X |
| 395207 | 5373 |
| 395419 | SW622 |
| 395840 | 6220 |
| 396235 | 5387 |
| 397023 | 5387 |
| 432925 | 5363 |
| 433226 | 6243 |
| 433850 | BK900 |
| 433852 | SR363 |
| 434495 | 6241 |
| 434496 | 6241 |
| 434517 | JSA517 |
| 434795 | 6220 |
| 435532 | 6242 |
| 435548 | 6244 |

B.R.P. - O.M.C.



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|--------|-------|
| 437666 | 6244 |
| 437801 | 6242 |
| 438529 | 6241 |
| 438531 | 6241 |
| 438786 | 6238 |
| 438878 | 5363 |
| 439937 | 6238 |
| 580841 | AR103 |
| 581305 | AR103 |
| 581366 | AR104 |
| 581528 | SW340 |
| 581603 | AR103 |
| 581778 | AR104 |
| 582048 | 6206 |
| 582155 | 6206 |
| 582195 | R473 |
| 582304 | AR104 |
| 582307 | AR103 |
| 582399 | AR103 |
| 582472 | R473 |
| 582473 | R473 |
| 582708 | SW622 |
| 583408 | AR103 |
| 583473 | 5390 |
| 583482 | 5389 |
| 583940 | AR104 |
| 584107 | 6206 |
| 584128 | SW268 |
| 584416 | R473 |
| 584580 | SW580 |
| 584608 | 5368 |
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| 584980 | 5399 |
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| 585051 | 5372 |
| 585056 | 5389 |
| 585057 | 5372 |
| 585058 | 5370 |
| 585059 | 5390 |
| 585060 | 5386 |
| 585061 | 5376 |
| 585062 | 5373 |
| 585063 | 5371 |
| 585197 | 5370 |
| 585265 | SR376 |
| 585266 | SR372 |
| 585267 | DV372 |
| 586100 | DV372 |
| 586101 | DVK89 |
| 586102 | DVK76 |
| 586147 | R473 |
| 586180 | SW622 |
| 586224 | R473 |
| 586274 | 5361 |
| 586275 | 5368 |





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|--------|-------|
| 586276 | 5369 |
| 586277 | 5398 |
| 586278 | 5376 |
| 586279 | 5389 |
| 586280 | 5371 |
| 586281 | 5370 |
| 586283 | 5372 |
| 586284 | 5399 |
| 586285 | 5386 |
| 586286 | 5363 |
| 586287 | 5363 |
| 586288 | 5373 |
| 586289 | 5387 |
| 586392 | DV387 |
| 586411 | 5387 |
| 586730 | SW730 |
| 586731 | 5387 |
| 586767 | R767 |
| 586768 | 5358 |
| 586774 | SW590 |
| 586842 | SW394 |
| 586890 | 5387 |
| 586897 | 5387 |
| 586957 | 5387 |
| 587020 | SW595 |
| 587045 | 5358 |
| 763454 | 5369 |
| 778991 | 5390 |
| 778992 | 5373 |
| 778993 | 5371 |
| 778994 | 5386 |
| 778995 | 5361 |
| 778996 | 5398 |
| 979768 | 6211 |
| 979774 | SW774 |
| 979937 | 6211 |
| 980801 | SW394 |
| 981074 | 30460 |
| 981078 | 30160 |
| 981186 | 40152 |
| 981187 | 40152 |
| 981410 | SW268 |
| 981638 | 6211 |
| 981703 | SW394 |
| 981821 | 70200 |
| 982058 | 6204 |
| 982069 | 6211 |
| 982073 | 6211 |
| 982107 | 30460 |
| 982121 | 30460 |
| 982151 | TR211 |
| 982187 | SW268 |
| 982189 | SW394 |
| 982200 | 30460 |
| 982311 | TR204 |
| 982364 | 20104 |
| 982706 | 6204 |
| 983019 | 6220 |
| 983248 | 30460 |
| 983195 | 6214 |
| 983318 | 6211 |
| 983424 | 60125 |
| 983444 | 30460 |
| 983446 | 6220 |

B.R.P - O.M.C.

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| 983790 | 30460 |
| 984356 | 6206 |
| 984456 | 30470 & MBK450 |
| 984536 | 70212 |
| 984565 | 60125 |
| 984628 | 70216 |
| 985063 | SW268 |
| 985064 | SW730 |
| 985237 | 6220 |
| 985465 | 60125 |
| 985466 | 60125 |
| 985799 | SW984 |
| 985964 | 40152 |
| 985966 | 30460 |
| 986008 | 60125 |
| 986280 | 6245 |
| 986505 | 30470 & MBK450 |
| 987774 | 60070 |
| 987811 | 70125 |
| 987883 | SW125 |
| 987969 | 70200 |
| 988012 | 70125 |
| 988013 | 70212 |
| 988217 | 30460 |
| 988247 | 60125 |
| 0586767 | R767 |
| 3850216 | SW463 |
| 3850525 | 30470 & MBK450 |
| 3850526 | 30460 |
| 3853839 | SW394 |
| 3853853 | 60125 |
| 3853869 | SW984 |
| 3853945 | 6245 |
| 3853982 | 30470 & MBK450 |
| 3853998 | SW984 |
| 3854182 | 60125 |
| 3854190 | 70125 |
| 3854194 | SW125 |
| 3854750 | 30460 |
| 3854751 | 30470 & MBK450 |
| 3854809 | 60125 |
| 3855177 | 30470 & MBK450 |
| 3855882 | 30460 |
| 3856600 | 60070 |
| 3857298 | 60125 |
| 3857533 | R473 |
| 3857561 | 60070 |
| 3857747 | 30470 & MBK450 |
| 3858463 | 30460 |
| 3860566 | 30470 & MBK450 |
| 3860769 | 60125 |
| 5004518 | JSA518 |
| 5005254 | 6238 |
| 5005374 | 6241 |
| 5005376 | 6241 |
| 5005831 | 6248 |
| 5006319 | 6247 |
| 5036732 | 6240 |

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| R13001 | SW394 |
| R130013 | SW125 |
| R130014 | SW295 |
| R200000 | 70201 |
| RA097002 | 40147 |
| RA097006 | 60108 |
| RA097006A | 60108 |
| RA097007 | 20815 |
| RA097007A | 20821 |
| RA097007B | 20825 |
| RA097007C | 20822 |
| RA097009 | 20826 |
| RA122001 | 70200 |
| RA122002 | 70201 |
| RA122004 | 70108 |
| RA122008 | 30456 |
| RA122009 | 30459 |
| RA122014 | 70125 |
| RA122015 | 30433 |
| RA122016 | 30460 |
| RA122019 | 30462 |
| RU0050 | SW456 |
| RU0050A | SW463 |
| RU0050B | SW463 |

POLARIS

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| 3240120 | DV744 |
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SEA DOO

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| 29550089 | DV650 |
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SIERRA

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| 18-5601 | 5366 |
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| 18-5603 | 30459 |
| 18-5604 | 5375 |
| 18-5605 | 5379 |
| 18-5606 | 5388 |
| 18-5608 | 5380 |
| 18-5609 | 5381X |
| 18-5610 | 5392 |
| 18-5611 | 5367 |
| 18-5612 | 5363 |
| 18-5613 | 5393 |
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| 18-5623 | 5368 |
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| 18-5630 | 5371 |

SIERRA

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| 18-5632 | 5399 |
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| 18-5647 | 5372 |
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| 18-5649 | 5377 |
| 18-5650 | DV366 |
| 18-5651 | DV385 |
| 18-5655 | DV376 |
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| 18-5658 | DV381 |
| 18-5659 | DV325 |
| 18-5671 | DV390 |
| 18-5673 | DV393 |
| 18-5674 | DV380 |
| 18-5675 | DV387 |
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| 18-5678 | DV389 |
| 18-5679 | DVK72 |
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| 18-5682 | DV396 |
| 18-5697 | BK900 |
| 18-5702 | R952 |
| 18-5704 | R832 |
| 18-5705 | R473 |
| 18-5707 | AR351 |
| 18-5708 | AR103 |
| 18-5709 | AR104 |
| 18-5710 | VR405 |
| 18-5711 | VR404 |
| 18-5712 | VR407 |
| 18-5714 | VR095 |
| 18-5727 | VR406 |
| 18-5728 | VR405 |
| 18-5729 | R211 |
| 18-5800 | R012 |
| 18-5801 | SW394 |
| 18-5802 | SW981 |
| 18-5803 | SW774 |
| 18-5804 | SW975 |
| 18-5807 | SW081 |
| 18-5808 | SW622 |
| 18-5811 | SW463 |
| 18-5812 | SW268 |
| 18-5813 | SW268 |
| 18-5814 | SW340 |
| 18-5815 | SW275 |
| 18-5816 | SW054 |
| 18-5817 | SW058 |
| 18-5818 | SW064 |
| 18-5819 | SW097 |
| 18-5820 | SW099 |



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| 18-5821 | SW945 |
| 18-5822 | SW926 |
| 18-5823 | SW580 |
| 18-5833 | SW590 |
| 18-5834 | SW109 |
| 18-5835 | SW295 |
| 18-5836 | SW661 |
| 18-5837 | SW984 |
| 18-5838 | SW975 |
| 18-5841 | SW774 |
| 18-5842 | SW412 |
| 18-5843 | SW424 |
| 18-5900 | 30460 |
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| 18-5902 | 30457 |
| 18-5903 | 70200 |
| 18-5904 | 70201 |
| 18-5905 | 30470 & MBK450 |
| 18-5906 | 10113 |
| 18-5907 | 30456 |
| 18-5908 | 30457 |
| 18-5910 | 30470 & MBK450 |
| 18-5911 | 30460 |
| 18-5913 | 30470 & MBK450 |
| 18-5914 | 70200 |
| 18-5915 | 70201 |
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| 18-5923 | 70200 |
| 18-5927 | 70216 |
| 18-5929 | 20860 |
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| 18-5951 | 20104 |
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| 18-6251 | SR104 |
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| 18-6259 | 6267 |

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| 18-6263 | 60108 |
| 18-6264 | R036 |
| 18-6265 | 60071 |
| 18-6266 | R040 |
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| 18-6278 | 84150 |
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| 18-6283 | 5381 |
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| 18-6287 | SW450 |
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| 18-6443 | 30462 |
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| 18-6455 | 20850 |
| 18-6754 | 6209 |
| 18-6755 | 6204 |
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| 18-6761 | 6206 |
| 18-6762 | 6216 |
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| 18-6765 | 6270 |
| 18-6767 | 6208 |
| 18-6767-1 | 6208 |
| 18-6769 | 6275 |
| 18-6769-1 | 6275 |
| 18-6770 | 6227 |
| 18-6771 | M525 |
| 18-6772 | 6218 |
| 18-6773 | 6250 |
| 18-6774 | 6279 |
| 18-6775 | 6274 |
| 18-6777 | 6276 |
| 18-6778 | M532 |
| 18-6779 | 6245 |
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| 18-6829 | 5359 |
| 18-6838 | 6225 |
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| 18-6843 | 60075 |
| 18-6845 | 60073 |
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| 18-6852 | BI-1602 |
| 18-6854 | BI-1603 |
| 18-6855 | BI-0702 |
| 18-6860 | WH800 |

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| 18-6864 | 5397 |
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UNIVERSAL



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PART NUMBER QUICK REFERENCE

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STATE-OF-THE-ART, COMPUTERIZED TESTING EQUIPMENT



Armature Tester

DID YOU KNOW...

You have a better chance at winning a lottery than you have of receiving an  unit that doesn't perform!

EVERY  unit is load tested with state-of-the-art testing equipment.



Permanent Magnet Motor Load Tester




Wire Wound Motor Load Tester

We have invested over a million dollars in fully automated computerized testing equipment for our inboard starters, outboard starters and tilt/trim motors. Each and every unit is tested for performance beyond its normal operating condition. The testers pictured above are specifically designed for testing inboard and outboard starters and are just three of five different testers we have in use today. We also have one designed for testing tilt/trim motors and another for testing hydraulic pump assemblies.

Most manufacturers only perform spot tests or a free run only test. It is impossible to know that every unit is performing to specification without performing an extensive load test on every unit. It is very expensive to test each and every unit, however, our goal is to supply you with the highest quality unit possible at a reasonable price.

After completion of a thorough test procedure, detailed test results are displayed. The tests are so complete that even the resistance of the solenoid contacts are shown on the report. Armature ripple is also shown along with a performance curve. If a unit fails to perform to specification it is rejected and is sent to our quality assurance department for inspection.

**We call this
VALUE!**

The next time you install an  part you can have confidence that the part will perform to O.E.M. specifications.

IMPORTANT BATTERY FACTS

A good battery can provide four or five years of worry-free service with the right kind of care.

Bigger is better! The battery you are replacing does not have to be the same size as the original. **IT IS ALWAYS BETTER TO HAVE EXTRA BATTERY CAPACITY.**

POINTS TO REMEMBER

- ☞ The battery is the heart of the electrical system
- ☞ Always start troubleshooting at the battery
- ☞ Never store a battery in a discharged state
- ☞ Never add anything except distilled water to a battery



DRY CHARGED BATTERIES MUST BE CHARGED BEFORE USING

Many small batteries are supplied with the electrolyte in a separate container. If you have to fill a new battery with electrolyte, **YOU MUST PLACE THE BATTERY ON A QUICK CHARGER.** The charging system will never bring the battery to a fully charged state. **THE BATTERY CAPACITY WILL NEVER BE ABOVE 80%.** Pulling the battery out later and trying to charge it will not work. **THE BATTERY'S CAPACITY HAS BEEN PERMANENTLY CUT BY 20% AND THERE IS NOTHING YOU CAN DO ABOUT IT.**

BATTERIES WILL SELF DISCHARGE WHEN STORED

Batteries will self discharge when stored for long periods of time. This is a normal process with all lead acid batteries. **Always charge the battery to full charge before storing.** Also disconnect the negative battery cable. This will keep the small system drains from accelerating the discharge process. The best way to avoid shortened battery life is **use a SMART CHARGER (not a trickle charger)** on the battery when it's not being used. A smart charger is a charging device that will maintain the battery at a full state of charge by only charging the battery when the voltage drops to a specified level without overcharging.



ELECTROLYTE BECOMES WATER IN A DISCHARGED BATTERY



As a battery becomes discharged the percentage of sulfuric acid in the electrolyte becomes less. The sulfuric acid combines with the lead plates producing lead sulfate. As this happens **the electrolyte solution becomes pure water.** A discharged battery will freeze in cold climates, which will destroy the insulators and plates inside it.

LOOSE BATTERY TERMINAL ENDS CAN DESTROY A BATTERY

Loose or corroded battery cable lugs can cause all sorts of problems. When the starter is engaged the loose or corroded connection can cause a heavy arc which will melt the post right out of the battery. If the battery is gassing, the arc can cause the battery to explode. Never use the temporary type battery ends. These are only good for emergency use and will become corroded in a short period of time. **Always use a crimped and sealed battery cable end or replace the battery cable.**

Make sure there is a gap between the ends of the terminal when tight.



BATTERY TESTING PROCEDURES

WARNING! Batteries give off hydrogen gas constantly. Hydrogen gas is highly explosive. Always wear safety glasses or goggles and use caution when working with batteries.

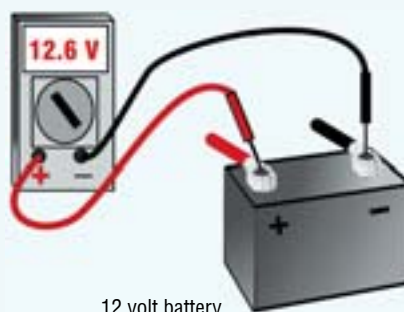
OPEN CIRCUIT VOLTAGE TEST

Before you can properly test any battery it must be at FULL CHARGE.

You can verify the state of charge with the use of a **digital multimeter**.

Connect the digital multimeter to the battery terminals. A fully charged 12 volt battery will read at least 12.6 volts (2.1 volts per cell) on the multimeter. **If your reading is 12.4 OR BELOW you must recharge the battery before testing.**

| Open Circuit Volts | Percent of Charge |
|--------------------|-------------------|
| 11.7 volts or less | 0% |
| 12.0 | 25% |
| 12.2 | 50% |
| 12.4 | 75% |
| 12.6 or more | 100% |



LOAD TESTING THE BATTERY

Before you can properly test any battery it must be at FULL CHARGE.

The only way you can thoroughly test a battery is to place a high amperage load across the battery terminals.

Starter motors have very high amperage requirements which can exceed 300 amps on certain engine applications. If the battery has to be recharged you must first remove the surface charge. This can be done by using the starter. Disable the ignition spark (consult manufacturer's method to avoid electronic ignition) and crank the engine for 10-15 seconds. Once you have removed the surface charge, disconnect the battery cables and connect the battery load tester to the battery posts.

Determine the cold cranking amperage rating of the battery you are testing.
If the cold cranking amp rating (CCA) is not known, use 450 CCA for four cylinder engines, 550 CCA for six cylinder engines and 650 CCA for V-8 engines.

Adjust current draw on the load tester to 50% of the CCA rating. Continue this for 15 seconds while viewing the voltage reading on the battery tester. The voltage should stay above the specified reading (see chart below) without falling off. If the voltage remains at the specified level or above, the battery would be considered good. If the voltage reading drops below the specified level, replace the battery.

| Load Test Chart | | |
|-----------------|-----------------------|---------------|
| Minimum Voltage | Temperature (degrees) | |
| 9.6 | 70 F | 21C and above |
| 9.5 | 60F | 16C |
| 9.4 | 50F | 10C |
| 9.3 | 40F | -1C |
| 9.1 | 30F | -7C |
| 8.9 | 20F | -12C |
| 8.7 | 10F | -18C |
| 8.5 | 0F | -18C |

Tech Tip

Rust, Corrosion or Submersions are NOT COVERED BY WARRANTY

The best offense is a great defense

Moisture is the number one "killer" of marine starters. That is why, from start to finish, we design and manufacture our starters with corrosion protection in mind. In fact, over three million dollars has been invested in totally computerized production and testing machinery. Follow along as we show you how we not only go to war against corrosion, but build quality into each and every ARCO part.

First, we start with nickel-plated armature shafts and silicon steel lamination stacks. Add a layer of powder coating, the best insulation and corrosion preventative available, and you are ahead in the battle.

Next, the commutator is attached, computer-wound copper windings are added, and a ground fault test is made on each armature. Strategic testing during the early stages of assembly is an essential maneuver for uncovering and correcting potential weaknesses. The commutator tabs are then crimped and hot stacked. On the lathe, the commutator face is smoothed and polished ensuring the brushes run as friction-free as possible. A computerized 18 point armature check is made at this time.

Now the armature goes onto our automated, state-of-the-art assembly line. The first stop is the polyester trickle varnish "carousel". The varnish not only assists in holding the windings in place during peak performance, but also dissipates heat—another of the starter's enemies. Moving along, the armatures are now inserted into the epoxy coated shell. The shells have been previously prepared with high performance magnets bonded to the interior. Nuts, bolts, gaskets, a spring, drive gear, brush kit and end cap are added to complete the assembly of the starter. The high performance magnets are now fully charged. Last, but not least, a computerized full load performance test is conducted on each and every starter. Only by passing this final inspection is an ARCO starter certified as ready for battle.

REPLACEMENT OUTBOARD STARTERS



3410 (NEW)

FITS: TOHATSU 45-140 HP, 2 Stroke

Replaces: Hitachi S114-415A,
S114-415, S114-571A,
S114-667

9-tooth drive gear



DV510*
9-tooth
drive gear



SR410*
Brush holder
assembly



***Will Fit These Starters Only:**

ARCO 3410, Hitachi S114-667, Tohatsu FM 5900

3412 (NEW)

**FITS: SUZUKI, TOHATSU,
NISSAN 30-40 HP, 2 Stroke**

Replaces: Hitachi S108-94,
S108-112, S108-120

9-tooth drive gear



DV512*
9-tooth
drive gear



SR412*
Brush holder
assembly



***Will Fit These Starters Only:**

ARCO 3412, Hitachi S108-120, Tohatsu 3C8-76010-100

3420 (NEW)

**FITS: YAMAHA 25-40 HP, 2 Stroke
MARINER 20-40 HP, 2 Stroke**

Replaces: Hitachi S108-80,
S108-80A, S108-80B

11-tooth drive gear



DV520*
11-tooth
drive gear



SR420*
Brush holder
assembly



***Will Fit These Starters Only:**

ARCO 3420, Hitachi S108-80B, Yamaha 689-81800-13

3421 (NEW)

FITS: YAMAHA

1984-1997 9.9-15 HP

1988-1998 25 HP

Replaces: Hitachi S106-07B,
S106-07E, S106-07F

10-tooth drive gear



3422 (NEW)

FITS: YAMAHA

1984-UP 70 HP

1991-UP 60 HP, 2 Stroke

Replaces: Hitachi S108-97A

9-tooth drive gear



DV522*
9-tooth
drive gear



SR422*
Brush holder
assembly



***Will Fit These Starters Only:**

ARCO 3422, Hitachi S108-97A, Yamaha 6H3-81800-11

3423 (NEW)

FITS: YAMAHA

1987-UP 30 HP

1989-UP 40-50 HP

Replaces: Hitachi S108-87A

11-tooth drive gear



DV523*
11-tooth
drive gear



SR423*
Brush holder
assembly



***Will Fit These Starters Only:**

ARCO 3423, Hitachi S108-87A, Yamaha 6F5-81800-11



REPLACEMENT OUTBOARD STARTERS

3424 (NEW)

FITS: YAMAHA, MARINER

55-60 HP 2-Cyl, 2 Stroke Engines

Replaces: Hitachi S114-221

9-tooth drive gear



DV524*

9-tooth
drive gear



SR424*

Brush holder
assembly



***Will Fit These Starters Only:**

ARCO 3424, Hitachi S114-221J, Yamaha 697-81800-13

3425 (NEW)

FITS: YAMAHA

1984-1988 40-50 HP

Replaces: Hitachi S108-99B

9-tooth drive gear



DV525*

9-tooth
drive gear



SR425*

Brush holder
assembly



***Will Fit These Starters Only:**

ARCO 3425, Hitachi S108-99B, Yamaha 6H4-81800-12

3426 (NEW)

FITS: YAMAHA

1984-1996 115-200 HP, 2 Stroke

1995-2000 40-50 HP, 4 Stroke

MERCURY 40-50 HP, 4 Stroke

S/N 0G472132 & BELOW

Replaces: Hitachi S114-323

9-tooth drive gear



DV526*

9-tooth
drive gear



SR426*

Brush holder
assembly



***Will Fit These Starters Only:**

ARCO 3426, Hitachi S114-323C, Yamaha 6E5-81800-12

3427 (NEW)

FITS: YAMAHA

1994-1999 75 HP;

1991-1996 85 HP;

1984-UP 90 HP

Replaces: Hitachi S114-263B,

9-tooth drive gear



DV527*

9-tooth
drive gear



SR427*

Brush holder
assembly



***Will Fit These Starters Only:**

ARCO 3427, Hitachi S114-263B, Yamaha 688-81800-12

3428 (NEW)

FITS: YAMAHA 115-225 HP, 2 Stroke

Replaces: Hitachi S114-552, S114-660

9-tooth drive gear



DV528*

9-tooth
drive gear



SR428*

Brush holder
assembly



***Will Fit These Starters Only:**

ARCO 3428, Hitachi S114-660B, Yamaha 6N7-81800-10

3429 (NEW)

FITS: YAMAHA

1998-UP V200;

1994-UP 225 HP

1990-UP 250 HP

Replaces: Hitachi S114-559B

9-tooth drive gear



DV529*

9-tooth
drive gear



SR429*

Brush holder
assembly



***Will Fit These Starters Only:**

ARCO 3429, Hitachi S114-559B, Yamaha 61A-81800-01



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REPLACEMENT OUTBOARD STARTERS



3430 (NEW)

FITS: YAMAHA
1999-Up 80 HP, 4 Stroke
1999-Up 100 HP, 4 Stroke
MERCURY/MARINER
90 HP, 4 Stroke
 Replaces: Hitachi S114-828B
13-tooth drive gear



3431 (NEW)

FITS: YAMAHA
2000-Up LZ 150-175 HP
2000-Up VZ 150-175 HP
2000-Up Z 150-175 HP
2000-Up LZ 200-220 HP
 Replaces: Hitachi S114-836A
13-tooth drive gear



3432 (NEW)

FITS: YAMAHA
2000-Up F115, 4 Stroke
2000-Up LF115, 4 Stroke
MERCURY 90-115 HP EFI, 4 Stroke
 Replaces: Hitachi S114-838A
13-tooth drive gear



3433 (NEW)

FITS: YAMAHA
2004-Up 150 HP, 4 Stroke
2005-Up 250 HP, 4 Stroke
2006-Up 225 HP, 4 Stroke
 Replaces: Hitachi S114-867
13-tooth drive gear



3440 (NEW)

FITS: SUZUKI 75/85 HP,
1988-2000 2 Stroke
 Replaces: Hitachi S114-555
9-tooth drive gear



DV540*
9-tooth
drive gear



SR440*
Brush holder
assembly



***Will Fit These Starters Only:**

ARCO 3440, Hitachi S114-555, Suzuki 31100-95601

3442 (NEW)

FITS: SUZUKI 90/100,
150-225 HP, 2 Stroke
 Replaces: Hitachi
 S114-551, S114-674
8-tooth drive gear



DV542*
8-tooth
drive gear



SR442*
Brush holder
assembly



***Will Fit These Starters Only:**

ARCO 3442, Hitachi S114-674, Suzuki 31100-92E00

3444 (NEW)

FITS: SUZUKI
115-140 HP, 2 Stroke
 Replaces: Hitachi
 S114-437, S114-673
9-tooth drive gear



DV544*
9-tooth
drive gear



SR444*
Brush holder
assembly



***Will Fit These Starters Only:**

ARCO 3444, Hitachi S114-673, Suzuki 31100-94610



REPLACEMENT OUTBOARD STARTERS

Tech Tip

- Excess oil or grease may cause drive failure.
- Be sure to follow the lubrication directions shown on page 17.



“DO NOT”

SPRAY OIL OR OTHER LUBRICANTS ON O/B STARTER DRIVES

The O/B Starter Drives are Rubber Cushioned Drives. If any oil gets between the compression nut and the rubber grip surface, drive failure will result.



“DO”

REMOVE THE DRIVE ASSEMBLY WHEN APPLYING LUBE TO THE SHAFT

Always remove the drive assembly before applying lube to the shaft. Only apply a thin film of water resistant grease to the shaft. Make sure to wipe off any excess.

3446 (NEW)

FITS: HONDA

40 HP, 4 Stroke

Replaces: Hitachi S114-677,

S114-561;

Honda 31200-ZV5-0130,

31200-ZV6A-0130

9-tooth drive gear

CW Rotation



SR446*

Brush holder assembly

*Will Fit These Starters Only:

ARCO 3446, Hitachi S114-677, Honda 31200-ZV6A-0130

3447 (NEW)

FITS: HONDA

2002 - UP 115 & 130 HP

Replaces: Mitsubishi MOT 60381;

Honda: 31200-ZW5-003

13-tooth drive gear



5358 (NEW)

FITS: EVINRUDE

40, 50, 75, 90 HP

E-Tec Models

9-tooth drive gear



DV358

9-tooth drive gear

SR358

Brush holder assembly

5359 (NEW)

FITS: MERCURY/MARINER

8, 9.9, 13.5, 15 HP, 4 Stroke

YAMAHA 15 HP, 4 Stroke

9-tooth drive gear



DV359

9-tooth drive gear

SR359

Brush holder assembly

5360 (NEW)

FITS: MERCURY

2001-UP 40, 50, 60 HP

4-cyl, 4 Stroke

9-tooth drive gear



DV360

9-tooth drive gear

SR360

Brush holder assembly

5361 (NEW)

FITS: O.M.C.

1993-UP 9.9-15 HP

Small 10-tooth drive gear

2" casing



DV361

Small 10-tooth drive gear

SR361

Brush holder assembly



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REPLACEMENT OUTBOARD STARTERS



Tech Tip

• Excess oil or grease may cause drive failure.
• Be sure to follow the lubrication directions shown on page 17.

NOTE

When ordering drive assemblies for B.R.P./O.M.C. starters, be aware that some B.R.P./O.M.C. outboard starters use a 2-piece drive assembly; older B.R.P./O.M.C. starters use a 1-piece drive assembly.

**ORDER THE
CORRECT DRIVE.
THEY ARE NOT
INTERCHANGEABLE!**

5362 (NEW)

FITS: MERCURY 40-50 HP
1997-UP 4-Stroke
9-tooth metric drive gear

DV362
9-tooth metric
drive gear

SR362
Brush holder assembly



5363 (NEW)

FITS: O.M.C.
1991-UP 150-175 HP
V6 Eagle-Series
1997-UP V4 and V6
2003 75/90/115 HP
2003-UP 90/105/115
60° Engine
2004-UP 100-175 HP
Direct Injection

SR363
Brush holder assembly

JSA517
Jack shaft assembly/9-tooth drive gear
Fits Johnson Evinrude carbureted engines

JSA518
Jack shaft assembly/10-tooth drive gear
Fits Johnson Evinrude direct injection engines



DV517
9-tooth
drive gear

DV518
10-tooth
drive gear

5364 (NEW)

FITS: MERCURY
1998-UP 25 HP, 4 Stroke
Yamaha 25HP, 4 Stroke
9-tooth drive gear

DV364
9-tooth
drive gear

SR364
Brush holder assembly



5365 (NEW)

FITS: MERCURY
30/40/50/60 HP
1999-UP 3-cyl, 4 Stroke
2000-UP Yamaha
40HP, 4 Stroke
9-tooth drive gear

DV365
9-tooth
drive gear

SR365
Brush holder assembly



5366 (NEW)

FITS: MERCURY
35-50 HP
9-tooth drive gear

DV366
9-tooth
drive gear

SR366
Brush holder assembly





REPLACEMENT OUTBOARD STARTERS

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- Be sure to follow the lubrication directions shown on page 17.

NOTE

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**ORDER THE
CORRECT DRIVE.
THEY ARE NOT
INTERCHANGEABLE!**

5367 (NEW)
FITS: MERCURY/MARINER
1986-1996 6-15 HP
1980-2003 18-25 HP
10-tooth drive gear
2½" motor casing



DV367
10-tooth
drive gear



SR367
Brush holder assembly



5368 (NEW)
FITS: O.M.C.
1997-2000
9.9/15 HP, 4-stroke
10-tooth drive gear



DVK68*
2-pc drive kit
*See NOTE



SR368
Brush holder assembly



5369 (NEW)
FITS: O.M.C.
8/9.9-11 HP
1997-1998 4 stroke
1977-1992 9.9-15 HP
10-tooth drive gear
2" motor casing



DV369
10-tooth
drive gear



SR369
Brush holder assembly



Save Time With ARCO SR107 - BRUSH LOADING TOOL See page 75

Makes brush loading as simple as 1-2-3
The "perfect tool" for loading outboard starter brushes.
Strong stainless steel construction.



(1) Depress Brushes and
Slide End Cap In Tool

(2) Insert Armature

(3) Remove Tool Leaving Brushes Loaded For Assembly

**One Tool Fits
All These Caps!**



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REPLACEMENT OUTBOARD STARTERS



Tech Tip

• Excess oil or grease may cause drive failure.
• Be sure to follow the lubrication directions shown on page 17.

NOTE

When ordering drive assemblies for B.R.P./O.M.C. starters, be aware that some B.R.P./O.M.C. outboard starters use a 2-piece drive assembly; older B.R.P./O.M.C. starters use a 1-piece drive assembly.

**ORDER THE
CORRECT DRIVE.
THEY ARE NOT
INTERCHANGEABLE!**

5370 (NEW)

FITS: O.M.C.
55-75 HP 3-cyl
9-tooth drive gear



DV370*
9-tooth drive gear
*See NOTE

DVK70*
2-pc drive kit
*See NOTE



SR370
Brush holder assembly

5371 (NEW)

FITS: O.M.C.
50-60 HP 2-cyl
9-tooth drive gear



DV371*
9-tooth drive gear
*See NOTE

DVK71*
2-pc drive kit
*See NOTE



SR371
Brush holder assembly

5372 (NEW)

FITS: O.M.C.
85-140 HP; Late-model V4
Small 10-tooth drive gear



DV372*
Small 10-tooth drive gear
*See NOTE

DVK72*
2-pc drive kit
*See NOTE



SR372
Brush holder assembly

5372X (NEW)

FITS: O.M.C.
1969-1970 85-115 HP
1971-1972 85-125 HP
Large 10-tooth drive gear



DV372X
Large 10-tooth drive gear



SR372
Brush holder assembly



5373 (NEW)

FITS: O.M.C.
150-235 HP V6
8-tooth drive gear



DV373
8-tooth drive gear



SR373
Brush holder assembly





REPLACEMENT OUTBOARD STARTERS

Tech Tip

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- Be sure to follow the lubrication directions shown on page 17.

NOTE

When ordering drive assemblies for B.R.P./O.M.C. starters, be aware that some B.R.P./O.M.C. outboard starters use a 2-piece drive assembly; older B.R.P./O.M.C. starters use a 1-piece drive assembly.

**ORDER THE
CORRECT DRIVE.
THEY ARE NOT
INTERCHANGEABLE!**

5374 (NEW)

FITS: MERCURY
65-85 HP 4-cyl
10-tooth drive gear



DV374
10-tooth
drive gear



SR374
Brush holder assembly



5374X (NEW)

FITS: MERCURY
1956-1957 25-30 HP
1957 55 HP
1958 30-55 HP
1959 35 & 55 HP
Large 10-tooth
drive gear



DV374X
Large
10-tooth
drive gear



SR374
Brush holder assembly



5375 (NEW)

FITS: MERCURY/MARINER
50-90 HP/65 HP Jet
10-tooth drive gear



DV375
10-tooth
drive gear



SR375
Brush holder assembly



5376 (NEW)

FITS: O.M.C.
18-40 HP
11-tooth drive gear



DVK76*
2-pc drive gear kit
*See NOTE



DV376*
11-tooth
drive gear
*See NOTE



SR376
Brush holder assembly



5377 (NEW)

FITS: MERCURY/MARINER
90-175 HP Inline
150 HP V6
10-tooth drive gear



DV377
10-tooth
drive gear



SR377
Brush holder assembly



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REPLACEMENT OUTBOARD STARTERS



Tech Tip

• Excess oil or grease may cause drive failure.
• Be sure to follow the lubrication directions shown on page 17.

NOTE

When ordering drive assemblies for B.R.P./O.M.C. starters, be aware that some B.R.P./O.M.C. outboard starters use a 2-piece drive assembly; older B.R.P./O.M.C. starters use a 1-piece drive assembly.

**ORDER THE
CORRECT DRIVE.
THEY ARE NOT
INTERCHANGEABLE!**

5378X (NEW)

FITS: MERCURY/MARINER
V150 HP, V175 HP
Large 10-tooth
drive gear



DV378X
Large
10-tooth
drive gear



SR380

Brush holder assembly



5379 (NEW)

FITS: MERCURY/MARINER
40-50 HP
10-tooth drive gear



DV379
10-tooth
drive gear



SR379

Brush holder assembly



5380 (NEW)

FITS: MERCURY/MARINER
135-200 HP V6
105 HP Jet
8-tooth drive gear



DV380

8-tooth
drive gear



SR380

Brush holder assembly



5381 (NEW)

FITS: MERCURY
1999-UP 2.5 DFI
1996-1999 200 HP V6 DFI
1998-UP 225 HP V6 DFI
1999-UP 3.0L V6
9-tooth drive gear



DV381

9-tooth
drive gear



SR381

Brush holder assembly



5381X (NEW)

FITS: MERCURY/MARINER
150-225 HP
9-tooth drive gear



DV381

9-tooth
drive gear



SR380

Brush holder assembly





REPLACEMENT OUTBOARD STARTERS

Tech Tip

- Excess oil or grease may cause drive failure.
- Be sure to follow the lubrication directions shown on page 17.

NOTE

When ordering drive assemblies for B.R.P./O.M.C. starters, be aware that some B.R.P./O.M.C. outboard starters use a 2-piece drive assembly; older B.R.P./O.M.C. starters use a 1-piece drive assembly.

ORDER THE CORRECT DRIVE. THEY ARE NOT INTERCHANGEABLE!

5382 (NEW)
FITS: CHRYSLER/FORCE
35-50 HP
11-tooth drive gear



DV382
11-tooth drive gear



SR382
Brush holder assembly



5384 (NEW)
FITS: MERCURY/MARINER
2.0L, 2.4L, 2.5L V6,
COUNTER-ROTATING,
RACING OUTBOARDS
10-tooth drive gear



DV384
10-tooth drive gear



SR384
Brush holder assembly



5385 (NEW)
FITS: MERCURY
35-40 HP, 2-cyl
10-tooth drive gear



DV385
10-tooth drive gear



SR385
Brush holder assembly



5386 (NEW)
FITS: O.M.C.
1985-Up
120-140 HP V4
10-tooth drive gear



DV386*
10-tooth drive gear
*See NOTE



DVK86*
2-pc drive kit
*See NOTE



SR386
Brush holder assembly



5387 (NEW)
FITS: O.M.C.
V6, V8 loop
10-tooth drive gear



DV387
10-tooth drive gear



SR387
Brush holder assembly



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REPLACEMENT OUTBOARD STARTERS



Tech Tip

- Excess oil or grease may cause drive failure.
- Be sure to follow the lubrication directions shown on page 17.

NOTE

When ordering drive assemblies for B.R.P./O.M.C. starters, be aware that some B.R.P./O.M.C. outboard starters use a 2-piece drive assembly; older B.R.P./O.M.C. starters use a 1-piece drive assembly.

**ORDER THE
CORRECT DRIVE.
THEY ARE NOT
INTERCHANGEABLE!**

5388 (NEW)

FITS: MERCURY
50-60 HP, 3-cyl,
1991-1996 45 HP Jet
10-tooth drive gear



DV388
10-tooth
drive gear



SR388
Brush holder assembly



5389 (NEW)

FITS: O.M.C.
1989-Up 25, 40, 50 HP; 2-cyl
1990-Up 48-50 HP
9-tooth drive gear



DV389*
9-tooth drive gear
*See NOTE



DVK89*
2-pc drive kit
*See NOTE



SR389
Brush holder assembly



5390 (NEW)

FITS: O.M.C.
1987-1993 20-35 HP; 2-cyl
9-tooth drive gear



DV390*
9-tooth drive gear
*See NOTE

DVK90*
2-pc drive kit
*See NOTE



SR390
Brush holder assembly



5392 (NEW)

FITS: MERCURY/MARINER
100-125 HP Inline 4-cyl;
80 HP Jet
8-tooth drive gear



DV392
8-tooth
drive gear



SR392
Brush holder assembly



5393 (NEW)

FITS: CHRYSLER/FORCE
70-150 HP
9-tooth drive gear



DV393
9-tooth
drive gear



SR393
Brush holder assembly





REPLACEMENT OUTBOARD STARTERS

Tech Tip

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- Be sure to follow the lubrication directions shown on page 17.

NOTE

When ordering drive assemblies for B.R.P./O.M.C. starters, be aware that some B.R.P./O.M.C. outboard starters use a 2-piece drive assembly; older B.R.P./O.M.C. starters use a 1-piece drive assembly.

ORDER THE CORRECT DRIVE. THEY ARE NOT INTERCHANGEABLE!

5394 (NEW)

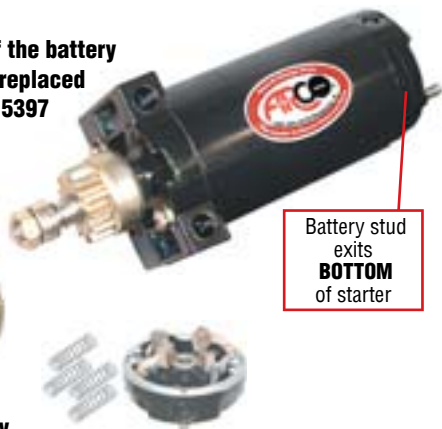
Determine location of the battery stud on starter being replaced before ordering - See 5397

FITS: FORCE

1996-1999 40-50 HP
13-tooth drive gear

DV394
13-tooth drive gear

SR394
Brush holder assembly



5395 (NEW)

FITS: MERCURY/MARINER

1994-Up 225 HP
8-tooth drive gear

DV395
8-tooth drive gear

SR395
Brush holder assembly



5396 (NEW)

FITS: MERCURY

1994-1996 30-40 HP,
2-cyl, 55-60 HP
1997-Up 45 HP Jet
10-tooth drive gear

DV396
10-tooth drive gear

SR396
Brush holder assembly



5397 (NEW)

Determine location of the battery stud on starter being replaced before ordering - See 5394

FITS: FORCE

1992-1995 40 HP
1992-1995 50 HP
13-tooth drive gear

DV397
13-tooth drive gear

SR397
Brush holder assembly



5398 (NEW)

FITS: O.M.C.

1997-1999
25-35 HP 3-cyl
10-tooth drive gear

DVK98*
2-pc 10-tooth drive gear
*See Note

SR398
Brush holder assembly



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REPLACEMENT OUTBOARD STARTERS



Tech Tip

- Excess oil or grease may cause drive failure.
- Be sure to follow the lubrication directions shown on page 17.

NOTE

When ordering drive assemblies for B.R.P./O.M.C. starters, be aware that some B.R.P./O.M.C. outboard starters use a 2-piece drive assembly; older B.R.P./O.M.C. starters use a 1-piece drive assembly.

ORDER THE CORRECT DRIVE. THEY ARE NOT INTERCHANGEABLE!

5399 (NEW)

MOTOR ONLY

FITS: O.M.C.

90-115 HP

1997-UP 60° V4

1998-2000 80 HP

1998-2000 100 HP



DV517

9-tooth drive gear



SR399

Brush holder assembly



JSA517

Jack shaft assembly/9-tooth drive gear

Fits Johnson Evinrude carbureted engines



5400 (NEW)

FITS: MERCURY

2001-UP

135-250 HP

200-250 Sport Jet

2005-UP

VERADO 4 STROKE

200-275 HP

14-tooth drive gear



SW463

Replacement solenoid

5551 (NEW)

FITS: CHRYSLER

25-35 HP

Large 10-tooth drive gear



DV551

Large 10-tooth drive gear



SR551

Brush holder assembly



7325 (NEW)

FITS: MERCURY/FORCE

90-120 HP Sport Jet

9-tooth drive gear



DV325

9-tooth drive gear



SR325

Brush holder assembly



7326 (NEW)

FITS: MERCURY

1996-UP V6 Sport Jet

8-tooth drive gear



DV326

8-tooth drive gear



SR326

Brush holder assembly



We could tell you why your starter failed, but we thought you might like to see for yourself.

If left unchecked, these problems will result in premature starter failure REGARDLESS of the STARTER MANUFACTURER.



Although the outside of the starter (at bottom right) looks fine, the flywheel picked up water from the bilge and pumped it inside the starter causing the corrosion shown here.

WATER INTRUSION IS THE #1 CAUSE OF STARTER FAILURE. If water gets pumped into the motor portion of the starter from the flywheel, it will not drain out. As you can see, rust and corrosion will destroy the inside components of the starter.



Shown here are damaged starter mounting pads. Water ingested into the engine stresses the mounting bolts beyond normal conditions. The bolts stretch and cause the starter to become loose. This could eventually lead to damage to the ring gear, starter casting and possibly the entire engine block.

THE #2 CAUSE OF STARTER FAILURE IS WATER INGESTED INTO THE ENGINE. Leaking exhaust manifolds, gaskets and risers are often the source. Damage to the mounting pads, as shown above, indicate the starter has been loose on the engine; possibly caused by water ingestion into the cylinder. Although the engine may not experience a complete hydro lock, if enough water is on top of the piston to raise the compression to a high level, the starter bolts and mounting pads will be stressed beyond normal load conditions.

DON'T BE FOOLED BY OUTWARD APPEARANCES. As shown here, the outside condition of the starter appears to be fine, but by removing and inspecting the lower starter case bolt, it is obvious water has gotten inside the starter.

These problems are not the fault of the starter. Simply replacing the starter without first locating and correcting the source of water intrusion will only result in more starter failures.

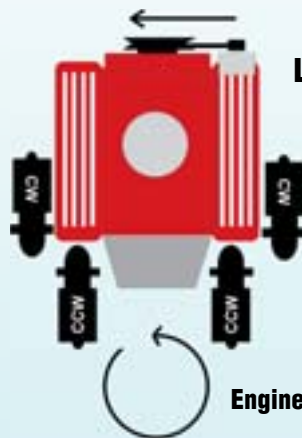
**If You Have Questions Or Need To
Locate A Distributor Near You Call
850-455-5476 or 800-722-2720**



Tech Tip

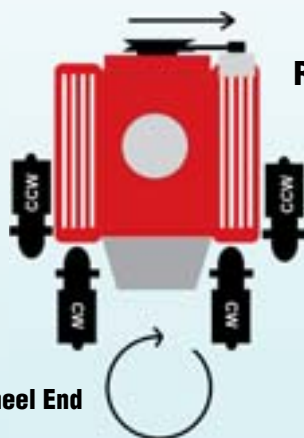
*These types of damage are
NOT COVERED BY WARRANTY*

How To Determine The Correct Starter Rotation



Left Hand Engine Rotation

This is the most common engine rotation found on today's marine engines. This is the same rotation as automotive engines. Use these charts to determine the correct starter rotation needed.



Right Hand Engine Rotation

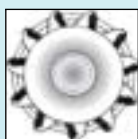
This is not very common on today's marine engines. This is the opposite rotation of automotive engines.

Engine Rotation Viewed From The Flywheel End

Another way to determine the starter rotation is to inspect the chamfer on the starter drive gear. The bevel will always be on the trailing edge.



Clockwise Rotation



Counter Clockwise Rotation

Important Check Points



Worn Out Battery

Batteries cause more trouble than any other component in a marine electrical system.

Always make sure the battery is completely charged and load tested before replacing other components.



Loose Connections

Be sure to check all the terminals and connections and make sure they are clean and tight.



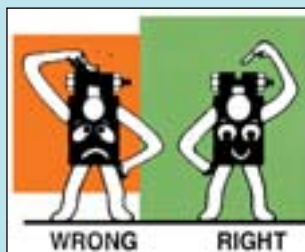
High Resistance

This is a very common problem found in marine electrical systems. Corrosion, undersized wire, or bad connections will cause low voltage to the electrical components. Low voltage causes high heat and will destroy electrical devices. Be sure to check for voltage drops.



Incorrect Wiring

Incorrect wiring can cause burnouts. Always tag the wires when removing an electrical component. **If you are not sure how to connect the wires call our technical department toll free at 800-722-2720.**



Loose Battery Clamps

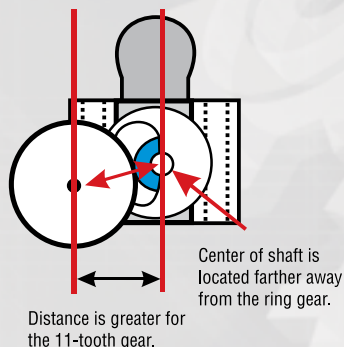
Cable terminals must be tight. If the ends of the clamps touch at the top, disconnect the cable clamps and shave the ends of the clamp jaws with a file so there is a gap.

DRIVE GEARS

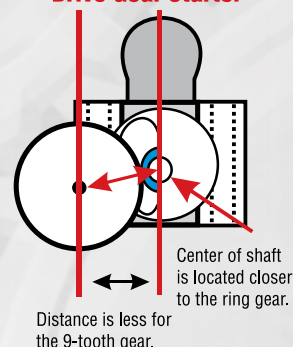
DID YOU KNOW...

Did you know the gear profile for the 9-tooth O.E.M. gear reduction starter and the 11-tooth ARCO High Performance gear reduction starter are the same? The only difference is the diameter of the drive gear. Since the 11-tooth drive gear has two more teeth it is naturally larger in diameter. To compensate for its smaller diameter, the center of the 9-tooth drive gear is located closer to the flywheel. Both starters are thus completely interchangeable. These are powerful starters and we are able to take advantage of a better gear ratio using this 11-tooth gear.

**ARCO 30470
11-tooth Drive Gear Starter**

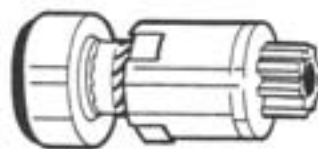


**O.E.M. 9-tooth
Drive Gear Starter**

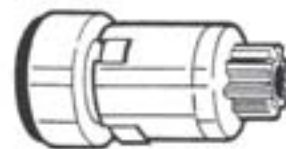


INERTIA DRIVES GEARS

As shown here, spinning the drive with a wire wheel in the direction it clicks will disengage the locks.



ENGAGED POSITION



DISENGAGED POSITION

Do not condemn a drive until it has been tried in actual operation and proven faulty.

The Folo-Thru type drive currently used on many starting motors has brought about difficulty due to a misunderstanding of operating and lack of information on proper servicing. This fact has been reflected by the number of drives returned for warranty which are fully operative.

The Folo-Thru drive is designed to lock and remain in the extended or engaged position until the engine starts and reaches approximately 400 to 500 RPM. The drive to flywheel rotation is fifteen to one. When the engine is turning at 400 RPM, the starter drive gear is turning 6,000 RPM. If the drive is locked in the extended position it has to be reinstalled on the engine and the engine started or the drive must be turned in excess of 6,000 RPM by a wire wheel mounted on an electric bench grinder to make it disengage.

The reason the pinion locks in the engaged position is to assure the starter continues to crank until the engine has started, thus preventing false starts. This is accomplished by using a spring loaded pin which rides on one of the pinion screw threads and drops into a hole when the pinion is in the fully engaged position. This locks the pinion in the engaged position. When the engine starts, the flywheel of the engine drives the starter pinion. A clutch mechanism is built into the pinion to protect the starter from excessive RPM.

The clutch allows the pinion to turn faster or overrun the armature shaft. When the engine reaches 400-500 RPM, the pinion spins fast enough to create the needed centrifugal force to throw the spring loaded pin out of the hole in the shaft and allow the pinion to disengage.

REPLACEMENT INBOARD STARTERS



Tech Tip

Rust, Corrosion or Submersions are
NOT COVERED BY WARRANTY

ARCO treats every component with special rust and corrosion resistant coatings to prevent water damage. However, it is impossible to protect the unit from direct contact with water. Therefore, a failure directly caused by rust, corrosion or submersion is not covered by warranty.

30433 (NEW)

VALUE PRICED!

STANDARD DUTY

**Direct O.E.M. replacement
gear reduction starter.**

FITS: ALL GM ENGINES

with 14" flywheel using a
staggered bolt pattern.

Recommended for late model 3.0 Liter
with 14" flywheel using tail bracket.



Can also be used in place of 10MT with two long bolt staggered
pattern or 30470!

*Mounting bolt kit MBK450 required if replacing 10MT.

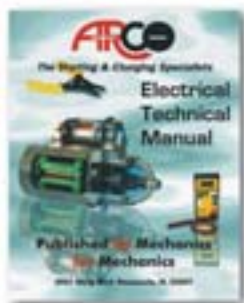
SW463 Replacement Solenoid

Electrical Technical Manual

Published by Mechanics for Mechanics

TM001

Electrical Technical Manual



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30456 (NEW)

HIGH-PERFORMANCE

**FITS: MERCUISER, CRUSADER, MARINE POWER,
PLEASURECRAFT, AND OTHERS.**

14MT, **CW** Rotation

30457 (NEW)

HIGH-PERFORMANCE

**FITS: MERCUISER,
CRUSADER, MARINE POWER,
PLEASURECRAFT, AND OTHERS.**

14MT, **CCW** Rotation



Replaces this 10 MT style starter

DV456

CW Rotation Replacement Drive

Fits: Delco 14 MT, ARCO 30456 starter

DV457

CCW Rotation Replacement Drive

Replaces: Mercury 850402

Fits: Delco 14 MT, ARCO 30457 starter

SW456

14 MT Replacement Solenoid

4 Post, 3-Bolt Mount



Four Post

Battery

R SW

Motor

Three-Bolt

Mount

30459 (NEW)

HIGH-PERFORMANCE

**FITS: MERCUISER,
CRUSADER,
MARINE POWER,
AND OTHERS.**

Light weight and compact;
permanent magnet gear reduction.

CCW Rotation



SW463 Replacement Solenoid





REPLACEMENT INBOARD STARTERS

Tech Tip

Rust, Corrosion or Submersions are

NOT COVERED BY WARRANTY

ARCO treats every component with special rust and corrosion resistant coatings to prevent water damage. However, it is impossible to protect the unit from direct contact with water. Therefore, a failure directly caused by rust, corrosion or submersion is not covered by warranty.

30460 (NEW)
HIGH-PERFORMANCE
Permanent magnet
gear reduction starter
FITS: MERCUISER,
COBRA, YAMAHA,
VOLVO PENTA
CW Rotation
12 $\frac{3}{4}$ " flywheel



INCLUDES
MOUNTING
BOLTS & GASKET



Replaces this
10 MT style
starter

30460 Will Replace all CW Rotating 10MT Starters with One Long and One Short Bolt Straight Across Pattern.

DV460
Replacement 9 tooth drive gear
fits **ARCO** 30460 only!



SW450
Replacement solenoid
For ARCO 30460 & 30470 only!
Does not include
plunger; see below.
Order plungers separately.



PA450S
1 $\frac{3}{4}$ " Plunger for **ARCO** SW450
Fits 30460



PA450L
2 $\frac{1}{4}$ " Plunger for **ARCO** SW450
Fits 30470



30462 (NEW)
FITS: 6.0L GM
ENGINES
Permanent magnet
gear reduction starter
with two long bolt
slight offset bolt pattern



SW463 Replacement Solenoid

30470 (NEW)
HIGH-PERFORMANCE
Permanent magnet
gear reduction starter
FITS: VOLVO PENTA,
MERCUISER,
MARINE POWER, ETC.
Two long bolt staggered pattern
14" flywheel, **CW Rotation**
Will also replace 9-tooth OEM version.



30470 Will Replace
all CW Rotating 10MT
Starters with Two Long Bolt
Staggered Pattern. DOES
NOT INCLUDE MOUNTING
BOLT KIT - SEE BELOW.



Replaces this
10 MT style
starter

MBK450
MOUNTING BOLT KIT REQUIRED
if replacing 10MT style starters.

DV450
Replacement 11-tooth drive gear



SW450
Replacement solenoid
For ARCO 30460, & 30470 only!
Does not include plunger; see below.
Order plungers separately.



PA450S
1 $\frac{3}{4}$ " Plunger for **ARCO** SW450
Fits 30460



PA450L
2 $\frac{1}{4}$ " Plunger for **ARCO** SW450
Fits 30470



50109
HEAVY-DUTY
FITS: CHRYSLER
318 Marine V8
Two-bolt mount,
1 threaded hole
12 Volt, **CW rotation**



50110
12 Volt, **CCW Rotation**



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REPLACEMENT INBOARD STARTERS



Tech Tip

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50134

HEAVY-DUTY

FITS: CHRIS CRAFT, HARMAN MARINE

Three-bolt mount (two 3/8" holes, one 5/16" threaded hole) 12 Volt, **CW Rotation**



50135

12 Volt, **CCW rotation**

50137

HEAVY-DUTY

FITS: CHRIS CRAFT AND OTHERS

Three-bolt mount, (two 3/8" holes, one 5/16" threaded hole) 12 Volt, **CW Rotation**



50138

12 Volt, **CCW rotation**

50141

HEAVY-DUTY

12 Volt, **CCW rotation**



50142

HEAVY-DUTY

FITS: CHRIS CRAFT, VOLVO PENTA V8

Two-bolt mount 12 Volt, **CW rotation**

50143

HEAVY-DUTY

FITS: MERCUISER 470

Threaded mounting stud in case 12 Volt, **CW rotation**



50160

HEAVY-DUTY

FITS: CHRIS CRAFT

Three-bolt housing 12 Volt, **CW rotation**



50161

HEAVY-DUTY

FITS: CHRIS CRAFT 12 Volt, **CCW rotation**

50169

HEAVY-DUTY

FITS: MERCUISER 888, 302, 351 FORDS
Two-bolt mount 12 Volt, **CW rotation**





REPLACEMENT INBOARD STARTERS

Tech Tip

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NOT COVERED BY WARRANTY

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70106

FITS: CRUSADER AND OTHERS W/FORD ENGINES

Nose extends 2" into flywheel

Two-bolt mount

12 Volt, CW rotation

Side battery terminal



70107

12 Volt, CCW rotation

Side battery terminal

SW394

Replacement solenoid

To be discontinued when present stock is exhausted.

70108

FITS: 460 FORDS

Heavy Duty

12 Volt, CW rotation



To be discontinued when present stock is exhausted.

70117

FITS: MANY LATE MODEL FORDS

Mod II style;

4½" diameter case

Nose extends 2¾" into flywheel

Two-bolt mount

12 Volt, CW rotation

Rear battery terminal



To be discontinued when present stock is exhausted.

SW394 Replacement solenoid

70125 (NEW)

Permanent magnet

Gear-reduction starter

FITS: MANY LATE MODEL

5.0L, 5.8L FORDS

12 Volt, CW rotation



SW125

Replacement solenoid

70200 (NEW)

HIGH PERFORMANCE

Permanent magnet

Gear-reduction starter

FITS: 302, 351 FORDS

12 Volt, CW rotation

Kit includes wiring harness to replace conventional starter.



70201 (NEW)

HIGH PERFORMANCE

CCW ROTATION

Same as above except CCW rotation.



Will also replace conventional style starter

SW125 Replacement solenoid

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Monday - Thursday

7:00 a.m. - 5:30 p.m. Central Time



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REPLACEMENT INBOARD STARTERS



Tech Tip

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70212 (NEW)
HIGH PERFORMANCE
Permanent magnet
Gear-reduction starter
FITS: 460 FORD ENGINES
Replaces: O.M.C. 988013
12 Volt, **CW** rotation
Two-bolt mount with 3/8" x 18
threaded mounting ear.
Kit includes wiring harness
to replace conventional starter.



Will also replace
conventional style starter

SW125 Replacement solenoid

70216 (NEW)
HIGH PERFORMANCE
Permanent magnet
Gear-reduction starter
FITS: 2.3L FORD ENGINES
Replaces: O.M.C. 988012
12 Volt, **CW** rotation
Three-bolt mount.
Kit includes wiring harness
to replace conventional starter.



Will also replace
conventional style starter

SW125 Replacement solenoid

90105 (NEW)
FITS: RENAULT & MERCUISER
70, 80, 90 series, **PARIS RHONE**
Three-bolt mount
12 Volt, **CW** rotation



90110 (NEW)
FITS: BUKH & RUGGERINI
DV8, RD80, 180,
181, RF140 series
Replaces: PARIS
RHONE D9E50
Two-bolt mount
12 Volt,
CCW rotation



90120 (NEW)
FITS: PERKINS, RENAULT MARINE,
VOLVO PENTA
Replaces: PARIS RHONE
D11E119T
Three-bolt mount
12 Volt,
CW rotation



SW814
Replacement solenoid



REPLACEMENT INBOARD STARTERS

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90125 (NEW)

24 Volt, CW rotation

**FITS: PERKINS,
RENAULT MARINE,
VOLVO PENTA**

Replaces: PARIS RHONE

D11E122T

Three-bolt mount



97308 (NEW)

Bosch Style Starter

**FITS: TAM120A, TAM120B,
VOLVO PENTA**

24 Volt, 11-Tooth Drive Gear

CW rotation



To be discontinued when
present stock is exhausted.

95949 (NEW)

**FITS: RENAULT MARINE,
VOLVO PENTA**

Replaces: PARIS RHONE

D11E126, D11E156

Three-bolt mount

12 Volt, CW rotation



98170

Lucas M45G starter

FITS: PERKINS 4-108VA

propulsion

13-tooth drive gear

12 volt, CW rotation



97225 (NEW)

Gear-reduction starter

**FITS: VOLVO PENTA TMD40,
TMD41, KAD42 and others.**

Replaces: PARIS RHONE/VALEO

D9R116, D9R144, D11E167T

Three-bolt mount, 12 Volt, CW
rotation



98175

**Mitsubishi gear
reduction starter**

FITS: WESTERBEKE

9-tooth drive gear

12 volt, CW rotation



**NEED
TECHNICAL
ASSISTANCE?**

1-800-722-2720

SW225 Replacement solenoid

DV225 Replacement drive gear



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REPLACEMENT INBOARD STARTERS



Tech Tip

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98180 (NEW)

FITS: YANMAR

GM, GM2, GM3,
GM10, GM20/2-20F,
GM30, GMF, 1GM,
2GM, 3GM

Replaces: HITACHI S114-303,
S114-303A



12200

**FITS: MANY MID-SIZE
PERKINS DIESELS**

4 cyl

10-tooth drive gear
12 Volt, **CW** rotation



98185 (NEW)

FITS: YANMAR

4JH, QM20,
2QM20, & 2T engines

Replaces: HITACHI S114-483,
S114-815



12202

**FITS: MANY MID SIZE
PERKINS DIESELS**

12-tooth drive gear
12 Volt, **CW** rotation



10113 (NEW)

Gear-reduction starter

FITS: VOLVO PENTA

4 cyl, 6 cyl gas
Aluminum pinion housing
w/2 threaded mounting holes

Permanent magnet,
12 volt, **CW** rotation



12205

FITS: CUMMINS

MARINE 6.9L,
PENINSULAR 6.2L,
379T, ETC.

10-tooth drive gear
12 Volt, **CW** rotation



12100

FITS: MANY SMALL

PERKINS DIESELS

10-tooth gear
12 Volt, **CW** rotation



12206

12 Volt, **CCW** rotation

12213 (NEW)

FITS: CUMMINS 6BT,
PENINSULAR,
6.2L **DIESEL, ETC.**

10-tooth drive gear
12 Volt, **CW** rotation



12101

10-tooth gear

12 Volt, **CCW** rotation

**To be discontinued when
present stock is exhausted.**

ARCO STARTING & CHARGING SPECIALISTS ©



REVERSABLE TILT-TRIM MOTORS

Today's tilt-trim motors use wire wound or permanent magnet fields.

BEFORE YOU CAN ACCURATELY TEST THE MOTOR YOU MUST KNOW WHAT TYPE IT IS.

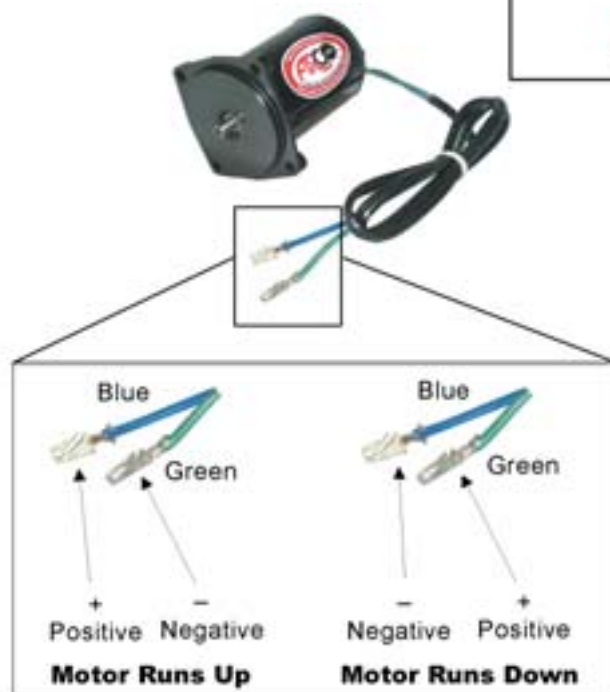
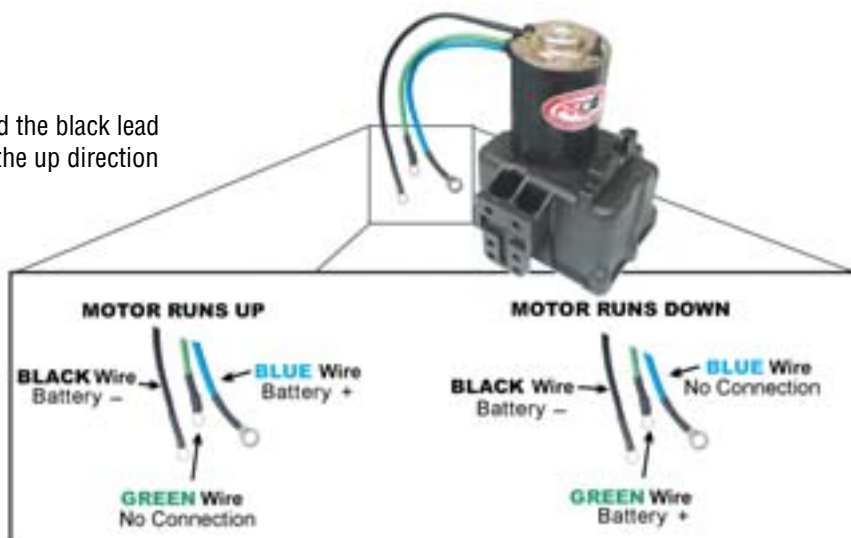
Wire wound field motors will normally have three wires and will usually have four screws placed around the perimeter of the motor case. If the motor has only two wires; it is usually a permanent magnet field motor. However, some older Mercury Marine wire wound field motors have only two wires and use an external ground that is attached to the motor housing. Since wire wound field motors have a higher current draw, solenoids are used to relay battery current to the motor. Permanent magnet field motors draw much less current and miniature relays are used to relay the battery current.

REMEMBER - BLUE SKY (UP) WIRE TO POSITIVE MAKES THE MOTOR RUN IN THE UP DIRECTION
GREEN GRASS (DOWN) WIRE TO POSITIVE MAKES THE MOTOR RUN IN THE DOWN DIRECTION

Wire Wound Field Motor

Connecting the blue lead to battery positive and the black lead to battery negative will make the motor run in the up direction and will raise the outdrive or outboard motor.

Connecting the green wire to battery positive and the black wire to battery negative will make the motor run in the down direction. This will lower the outdrive or outboard motor.



Permanent Magnet Field Motor

Connecting the blue lead to battery positive and the green lead to battery negative will make the motor run in the up direction. This will raise the outdrive or outboard motor.

Connecting the green lead to battery positive and the blue lead to battery negative will make the motor run in the down direction. This will lower the outdrive or outboard motor.

TILT-TRIM MOTOR REVERSING RELAYS

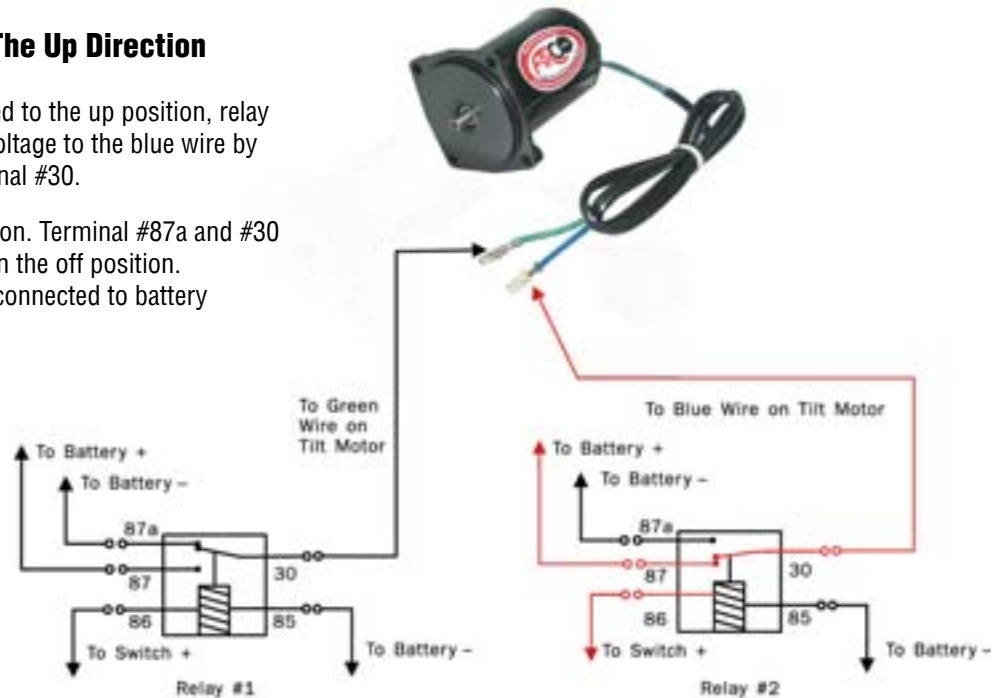
PERMANENT MAGNET FIELD MOTORS



Motor Running In The Up Direction

When the tilt-trim switch is moved to the up position, relay #2 activates supplying positive voltage to the blue wire by connecting terminal #87 to terminal #30.

Relay #1 remains in the off position. Terminal #87a and #30 are connected when the relay is in the off position. This allows the green wire to be connected to battery negative.

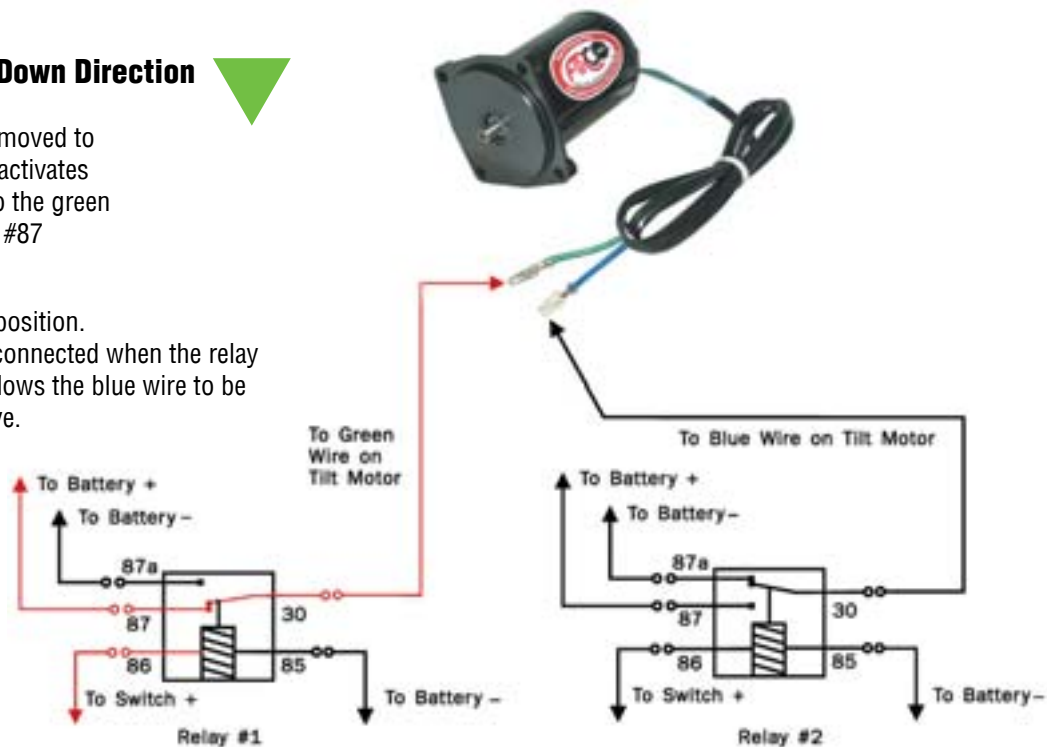


Motor Running In The Down Direction



When the tilt-trim switch is moved to the down position, relay #1 activates supplying positive voltage to the green wire by connecting terminal #87 to terminal #30.

Relay #2 remains in the off position. Terminal #87a and #30 are connected when the relay is in the off position. This allows the blue wire to be connected to battery negative.



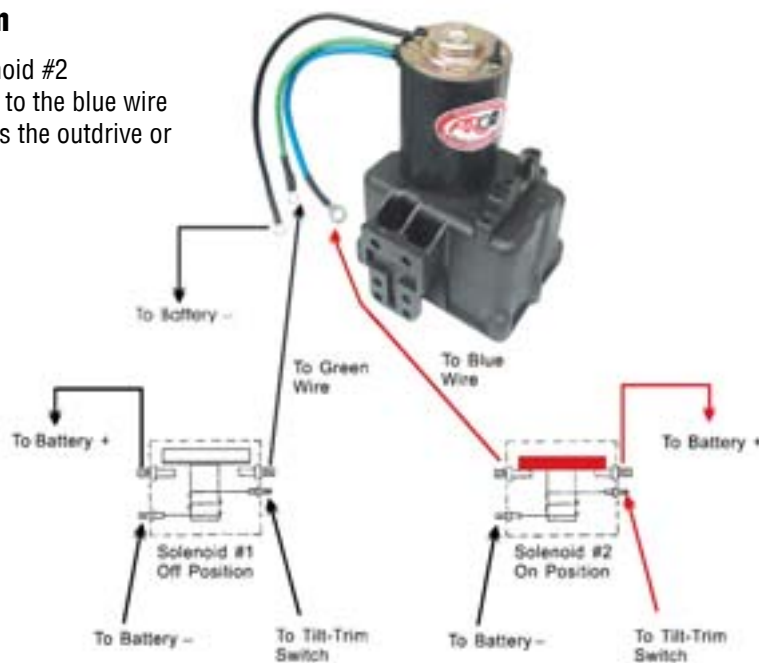
TILT-TRIM MOTOR SOLENOIDS

WIRE WOUND FIELD MOTORS



Motor Running In The Up Direction

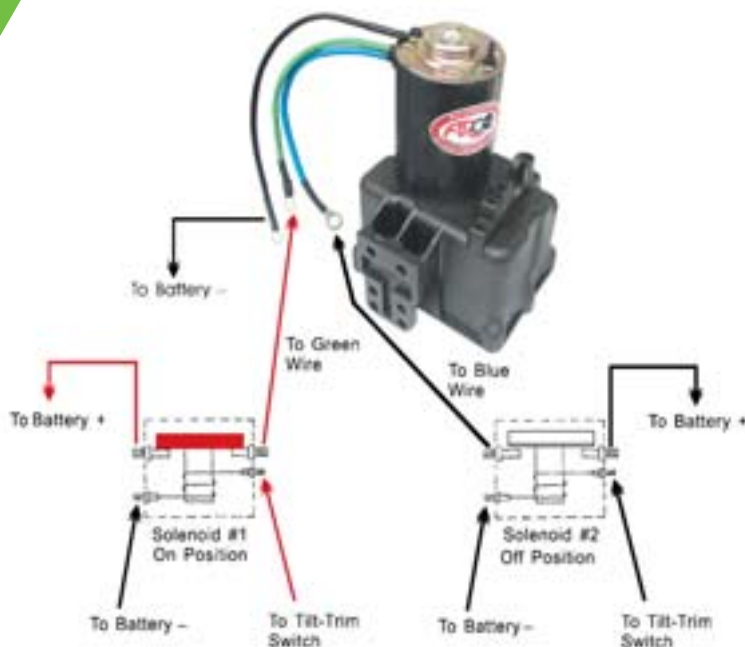
When the tilt-trim switch is in the up, position solenoid #2 is energized and battery positive voltage is supplied to the blue wire making the motor run in the up direction. This raises the outdrive or outboard motor.



Motor Running In The Down Direction



When the tilt-trim switch is in the down position, solenoid #1 is energized and battery positive voltage is supplied to the green wire making the motor run in the down direction. This lowers the outdrive or outboard motor.



REPLACEMENT TILT/TRIM MOTORS & REPAIR KITS



DO NOT CUT WIRES OR DISMANTLE UNITS

Cutting a unit's wires or dismantling a unit immediately voids the manufacturer's warranty. Water can easily seep into the motor through cut wiring. In addition, taking a motor off the reservoir and trying to install it on an old reservoir usually damages the brushes in the motor. Disassembled parts are not covered by warranty.

6204 (NEW)

FITS: O.M.C.
3-wire connection
2-bolt mount

TR204

Repair kit



6206 (NEW)

FITS: O.M.C.
3-wire connection
3-bolt mount

TR206

Repair kit



6208 (NEW)

(MOTOR/RESERVOIR ONLY)

FITS: O.M.C.

3-wire connection

TR208

Repair kit



6209 (NEW)

FITS: O.M.C.

2-wire connection

TR209

Repair kit



6211 (NEW)

FITS: O.M.C.

stern-drive 1979-1985

2.5L, 3.0L

3-wire connection

Ring Terminal Ends

TR211

Repair kit

(Cast Aluminum)



TR210

Repair kit

(Stamped Steel)





REPLACEMENT TILT/TRIM MOTORS & REPAIR KITS

6213 (NEW)
FITS: GOOD AUTOMATIC
WINDLASS
 Ring Terminal Ends



6214 (NEW)
MOTOR/RESERVOIR ONLY
FITS: O.M.C.
 1979-1985 3.8L,
 4.3L, 5.0L, 5.7L
 Stern Drive Engines
 2-wire connection



6216 (NEW)
(MOTOR/RESERVOIR ONLY)
FITS: CHRYSLER, O.M.C.
 3-wire connection



6217 (NEW)
(MOTOR/RESERVOIR ONLY)
FITS: B.M.W., MERCURISER,
VOLVO PENTA
 Includes: Screws,
 gasket & adapter
 Ring Terminal Ends

TAK217
 Screws, gasket, adapter



TR217
 Repair kit



6218 (NEW)
(MOTOR ONLY)
FITS: MERCURISER I/O'S AND
MERCURY OUTBOARDS
W/OILDYNE PUMP
 12 Volt
 Ring Terminal Ends

TR218
 Brush kit →



6219
 24 Volt
 Slow speed motor
 Fits Jack lift for racing
 outboards

Replaces early square-style motor



6220 (NEW)
HEAVY-DUTY
FITS: O.M.C.
 2-wire connection
Includes O-ring
3-bolt mount
 Male Spade Terminal Ends
 96" Leads

R473
 Relay available



6220X (NEW)
HEAVY-DUTY, FITS: O.M.C.
 2-wire connection, **Includes O-ring, 3-bolt mount**
 Male Spade Terminal Ends
 62" Leads



6223 (NEW)
HEAVY-DUTY
FITS: VOLVO PENTA
 Female Spade Terminal Ends



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REPLACEMENT TILT/TRIM MOTORS & REPAIR KITS



6224 (NEW)

(COMPLETE)

FITS: VOLVO PENTA

Includes: Hydraulic valve body
Ring Terminal Ends



6225 (NEW)

(MOTOR/ RESERVOIR ONLY)

Fits: PRESTOLITE

To be discontinued
when present stock
is exhausted



← Replaces this style
Prestolite Pump

6227 (NEW)

(COMPLETE)

FITS: VOLVO PENTA - THRU 1999
W/OILDYNE PUMP



6232

(MOTOR ONLY)

M531 (NEW)

RESERVOIR KIT

FITS: ARCO 6227

Includes: Reservoir,
cap, and O-ring



Fits Oildyne Pump ONLY

For new style 4 screw
mount see M533 in
miscellaneous section

6228 (NEW)

HEAVY-DUTY

(MOTOR ONLY)

FITS: MANY SMALL
O.M.C. OUTBOARDS

Includes gasket



Fits: O.M.C. Pump
No. 173946



TR228

Repair kit



6231 (NEW)

(MOTOR ONLY)

FITS: U.S. MARINE
W/OILDYNE PUMP

2-wire connection
Female Spade Terminal
Ends



6232 (NEW)

(MOTOR ONLY)

FITS: ARCO 6227,

LATE MODEL

VOLVO PENTA

W/OILDYNE PUMP

2-wire connection



NOTE:

Distance between
mounting bolts: 2.5"
Bolt size: 10x32 fine thread



REPLACEMENT TILT/TRIM MOTORS & REPAIR KITS

6233 (NEW)

FITS: LATE MODEL VOLVO PENTA SX MODELS.

Replaces Teleflex Motor and Volvo part number 3861575



NOTE:
Distance between mounting bolts: 2.3"
Bolt size: 10x24 coarse thread

6234 (NEW)

HEAVY-DUTY FITS: HONDA

2002-Up BF200, BF225

4-bolt mount, Round Plug-In Connector

Includes O-ring
Replaces Honda part number 36120-ZY3-013



Available mid 2014

6235 (NEW)

HEAVY-DUTY FITS: HONDA

2004-Up BF135, BF150

4-bolt mount, Round Plug-In Connector

Includes O-ring
Replaces Honda part number 36120-ZY6-013



Available mid 2014

6236 (NEW)

HEAVY-DUTY FITS: HONDA

2007-Up BF75, BF90

4-bolt mount, Round Plug-In Connector

Includes O-ring
Replaces Honda part number 36120-ZY9-003



Available mid 2014

6237 (NEW)

HEAVY-DUTY FITS: HONDA

2004-Up BF40, BF50

4-bolt mount, Round Plug-In Connector

Includes O-ring
Replaces Honda part number 36120-ZW4-H12



Available late 2014

6238 (NEW)

HEAVY-DUTY FITS: O.M.C.

1998-Up

75 HP-250 HP FFI Outboard Engines

4-bolt mount, Female Sealed Terminal Ends

Includes O-ring



6239 (NEW)

HEAVY-DUTY FITS: HONDA

1992-2002 35-50 HP

2-wire connection

Includes O-ring

4-bolt mount

Hollow-hex shaft
Female Spade Terminal Ends



6240 (NEW)

HEAVY-DUTY FITS: YAMAHA

1997-UP 115 HP

2000-UP 115 HP 4-Stroke

1997-2000 130 HP

1997-UP 150-200 HP

1998-UP 225 HP

2-wire connection

4-bolt mount,

Ring Terminal Ends

Includes O-ring



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REPLACEMENT TILT/TRIM MOTORS & REPAIR KITS



6241 (NEW)

HEAVY-DUTY

FITS: O.M.C. 60, 70, 90, 115, 150, 175 HP
1991-Up 200, 225 HP,
1991-94 120, 140 HP
1995-Up 50 HP 3-cyl, 60 HP, V4 130 HP
1997-Up 115-200 HP
1998-99 225 HP 2-wire connection
4-bolt mount, Flat-blade shaft
 Female Spade Terminal Ends



Includes O-ring and adaptor to replace motors with hollow hex shafts

R473

Relay available

ALSO REPLACES OEM MOTORS WITH HOLLOW HEX SHAFT

6242 (NEW)

HEAVY-DUTY

FITS: O.M.C.
1992-Up J-suffix 40, 48, 50 HP
 2-wire connection
Includes O-ring, 4-bolt mount
Hollow-hex shaft
 Female Spade Terminal Ends



R473

Relay available

6243 (NEW)

HEAVY-DUTY

FITS: O.M.C.
1989-1992 M-suffix 40, 48, 50 HP
 2-wire connection;
4-bolt mount, Includes O-ring
Hollow-hex shaft
 Male Spade Terminal Ends



R473

Relay available

6244 (NEW)

HEAVY-DUTY

FITS: O.M.C.
1993 V6
1993-Up Commercial V8
 2-wire connection;
3-bolt mount, Includes O-ring
Flat-blade shaft
 Female Spade Terminal Ends



R473

Relay available

6247 (NEW)

HEAVY-DUTY

FITS: EVINRUDE ETEC
2005-2009 70-90 HP
2007-2009 115 HP
2009- 130 HP
 2-wire connection
4-bolt mount, Includes
TAK247 mounting kit,
Flat-blade shaft



TAK247

Mounting bolts, flat washers,
 O-ring and couplers



6248 (NEW)

HEAVY-DUTY

FITS: EVINRUDE ETEC
2005-2009 40-50 HP
2006-2009 60 HP
2009- 25-30 HP
 2-wire connection
4-bolt mount, Includes
TAK247 mounting kit,
Flat-blade shaft



TAK247

Mounting bolts, flat washers,
 O-ring and couplers



6250 (NEW)

HEAVY-DUTY

FITS: Late model MERCURY
 135, 150 XR6, Magnum III,
 175, 200, 225, 250 HP,
 105-140 HP Jet
 2-wire connection,
2-bolt mount
Includes O-ring ,
Flat-blade shaft
 Bullet Connector Terminal Ends



**This motor will NOT replace an early model Mercury cartridge pump motor!
 Order Part No. 6278**



REPLACEMENT TILT/TRIM MOTORS & REPAIR KITS

6255 (NEW)

HEAVY-DUTY
FITS: Late model
MERCURY/FORCE
 25-50 HP outboards
 2-wire connection
4-bolt mount
Flat-blade shaft
 Bullet Connector
 Terminal Ends



6261 (NEW)

HEAVY-DUTY
FITS: YAMAHA
1999-2004 75, 80, 90 &
100 HP 4 Stroke O/B Engines
 2-wire connection
4-bolt mount,
 Ring Terminal Ends
Includes O-ring



6258 (NEW)

HEAVY-DUTY
FITS: YAMAHA
2005-UP 75 HP 4 Stroke
2005-UP 90 HP 4 Stroke
 2-wire connection
4-bolt mount
Includes O-ring
 Ring Terminal Ends



Available early 2014

6263 (NEW)

HEAVY-DUTY
FITS: YAMAHA
2002-2009 200, 225,
250 HP 4 Stroke
2002-2009 200-300 HP
2 Stroke
 2-wire connection
3-bolt mount
Includes O-ring
 Ring Terminal Ends



6259 (NEW)

HEAVY-DUTY
FITS: YAMAHA
2001-2004 50 HP 4 Stroke
2002-2004 60 HP 4 Stroke
2001-2006 40 HP 2 Stroke (TLR)
2003-2009 50 HP 2 Stroke (TLR)
 2-wire connection
3-bolt mount
Includes O-ring
 Ring Terminal Ends



6264 (NEW)

HEAVY-DUTY
FITS: YAMAHA
1985-1992
40-50 HP
 2-wire connection
4-bolt mount,
Includes O-ring
 Ring Terminal Ends



6260 (NEW)

HEAVY-DUTY
FITS: YAMAHA
1992-2002 90 HP
1992-1995 50-90 HP
1994 40 HP; 1996 70-90 HP
1997-Up 60, 70, 90 HP
 2-wire connection,
3-bolt mount
Includes O-ring
Flat-blade shaft
 Ring Terminal Ends



6265 (NEW)

HEAVY-DUTY
FITS: YAMAHA
1987-1995
115-200 HP Outboards
1990-1993 225 HP
 2-wire connection
3-bolt mount
Includes O-ring
Flat-blade shaft
 Ring Terminal
 Ends



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REPLACEMENT TILT/TRIM MOTORS & REPAIR KITS



6266 (NEW)

FITS: YAMAHA
1995-Up 40/50 HP
2-wire connection
3-bolt mount
Includes O-ring
Ring Terminal Ends



6267 (NEW)

FITS: YAMAHA
Early 70, 90, 115,
150-200 HP
3-wire connection
3-bolt mount
Ring Terminal Ends
4-mm thick shaft
blade with 68.3-mm
mounting collar.
Includes O-ring



6268 (NEW)

FITS: SUZUKI
1991-1997 DT90,
1991-2000 DT100,
1991-2003 DT150,
1991-1992 DT175,
1991-2000 DT200,
1991-2003 DT225
2-wire connection
3-bolt mount
Includes O-ring and adaptor
Ring Terminal Ends



6269 (NEW)

FITS: SUZUKI DT 150/200
3-wire connection
3-bolt mount
Includes O-ring
Ring Terminal Ends



6270 (NEW) (COMPLETE)

FITS: Late model MERCURY
225-275 HP Outboards w/Oildyne pump
Ring Terminal Ends



6271 (NEW) (COMPLETE)

Slow speed unit used for racing
applications

6274 (NEW)

HEAVY-DUTY
FITS: Late model
MERCURY/MARINER
& FORCE 75-125 HP
outboards w/single
ram 3-wire connection;
4-bolt mount
Hollow-hex shaft
(Motor/Reservoir Only for Trim
Pump Assembly 824051)
Includes stainless steel
mounting screws,
shaft adaptor, O-ring
and fill plug.
Ring Terminal Ends



6275 (NEW) (COMPLETE)

FITS: Late model MERCURISER
w/Oildyne pump
Ring Terminal Ends

6218 MOTOR ONLY

M525 (NEW)

Reservoir kit
FITS: ARCO 6275
Includes: Reservoir, cap, O-ring,
mounting screw



For new style 4 screw mount
Mercuriser 883166A2 see M532
in miscellaneous section



REPLACEMENT TILT/TRIM MOTORS & REPAIR KITS

6276 (NEW)

HEAVY-DUTY

FITS: Late model
MERCURY/MARINER, FORCE

40-125 HP outboards

w/single ram

2-wire connection

4-bolt mount

Hollow-hex shaft

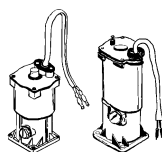
(Motor/Reservoir Only)

**Includes stainless
steel mounting screws, shaft adaptor,
O-ring and fill plug.**

Bullet Connector Terminal Ends



Will also replace these style units



TAK276

Mounting bolts, O-ring, fill cap and
shaft adapters for tilt/trim motors



6277 (NEW)

HEAVY-DUTY (MOTOR ONLY)

FITS: cartridge pump 6278 only!

2-bolt mount

Ring Terminal Ends



TR277

Repair kit



Motor WILL NOT replace original equipment. Order Part No. 6278

6278 (NEW)

(COMPLETE)

HIGH-PERFORMANCE

Cartridge pump

w/replaceable motor

FITS: MERCURY/MARINER

35-220 HP Outboards

2-bolt mount

w/Design I, 3 ram,

3-wire tilt/trim units

W/SIDE FILL RESERVOIR

Replaces square-style Eaton,
round-style Prestolite



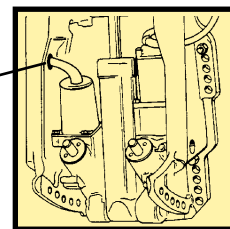
**To be discontinued when
present stock is exhausted.**

TR277

Repair kit



SIDE FILL RESERVOIR



6279 (NEW)

HEAVY-DUTY

FITS: MERCURY/MARINER

outboards w/Design II

3 ram, three-wire trim units

Hollow-hex shaft

W/AFT FILL RESERVOIR

3-wire connection

2-bolt mount

Shaft adaptor and

O-ring included.

Ring Terminal Ends



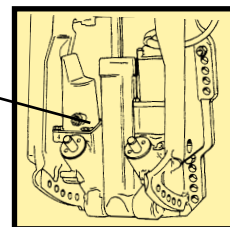
Replaces this
square motor

TR279

Repair kit



AFT FILL RESERVOIR



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CHARGING SYSTEMS

NOTE: ALTERNATORS ARE NOT BATTERY CHARGERS



* ENGINE HORSEPOWER REQUIRED FOR ALTERNATORS

For every 23 AMPS of alternator output about one horsepower is required.

FOR EXAMPLE: A 12 volt, 115 AMP alternator requires 5 horsepower.

(115 divided by 23 = 5 horsepower). A 24 volt unit requires twice the horsepower.



* ALTERNATORS ARE NOT BATTERY CHARGERS

Alternators are designed to supply current for the accessory load and maintain the charge of the battery. **Most alternators can safely charge at only two-thirds of their maximum rated output.** When trying to recharge a dead battery, the alternator will charge at maximum output for extended periods of time causing the alternator to overheat. **High heat destroys** transistors, diodes and windings.



* ONE-WIRE ALTERNATORS CAN NOT BE USED WITH BATTERY ISOLATORS

One-wire alternators, sometimes referred to as self-exciting alternators, require battery voltage at the output terminal in order to charge. Since battery isolators eliminate the battery voltage to the alternator, you must use a battery isolator with an ignition excite capability or modifications must be made to the alternator to allow ignition excitation.

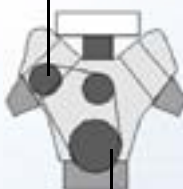


* ALTERNATORS MUST TURN THE PROPER RPM IN ORDER TO FUNCTION

Just because the alternator looks like it's turning, doesn't mean it's turning fast enough to charge. **Most alternators do not start charging until they reach 1,000 RPM** alternator shaft speed. 5,000 RPM alternator shaft speed is normally required to reach maximum output. If you're not sure what the alternator shaft speed is, you can determine this with the pulley ratio. Measure the diameter of the crank shaft or drive pulley and the alternator pulley. Divide the crank shaft pulley diameter by the alternator pulley diameter. This figure would be the engine-to-alternator RPM ratio. A normal ratio would be 2.5 to 1. For example, let's say we have a 7 inch diameter crank shaft pulley and a 2.75 inch alternator pulley. We would divide 7 inches by 2.75 which equals 2.54 to 1. If the engine was turning 1,000 RPM we would multiply 1,000 by 2.54 which would give us 2,540 alternator RPM.

Again, with today's high amperage alternators, belt condition and tension are critical in proper alternator performance.

Alternator Pulley



Crankshaft Pulley



IF YOU ARE ABLE TO TURN THE ALTERNATOR FAN BY HAND, YOU DO NOT HAVE THE BELT TIGHT ENOUGH.

* ALTERNATORS WILL CHARGE WHEN TURNING IN EITHER DIRECTION

* NEVER DISCONNECT THE BATTERY CABLE WHEN THE ALTERNATOR IS CHARGING

A common practice with the old generator system was to disconnect the battery cable while the engine was running to see if the generator was working. If this procedure is done on today's transistorized alternator systems, severe damage to the internal components of the alternator usually will be the end result. **This includes using a battery selector switch while the engine is running.**



ALTERNATORS APPROVED FOR MARINE USE

Alternators that are being installed on inboard gasoline engines must be certified to meet Coast Guard requirements for ignition protection. In order for the alternator to be certified, it must pass the testing procedure, Marine SAE J1171, laid-out by the Society of Automotive Engineers (SAE).

Brushes inside the alternator cause some sparking when the alternator is charging. This is normal for any alternator. When the alternator is exposed to a flammable atmosphere, such as an enclosed engine compartment on an inboard gasoline application with a fuel leak, the sparking from the brushes in the alternator may cause an explosion.

The Marine SAE J1171 testing procedure is as follows: A sparking device, similar to a spark plug, is installed in the brush area of the alternator. Another device is also installed in the brush area of the alternator to supply a specified mixture of propane gas and oxygen. The alternator is then placed in an explosion proof test chamber. The chamber and the alternator are then filled with the explosive gas mixture. A high-voltage coil supplies current to the sparking device in the brush area of the alternator, causing an explosion. An explosion must not occur in the test chamber while this test is being performed. This step is repeated nine times. Finally, a spark is supplied inside the test chamber causing an explosion to ensure that the explosive mixture was present during the testing operations.

VARIOUS MARINE APPROVED ALTERNATOR DESIGNS

Motorola Style



**Brush Cover
Installed**

**Brush Cover
Removed**

Prestolite Style



**Brush Cover
Installed**

**Brush Cover
Removed**

Delco Style

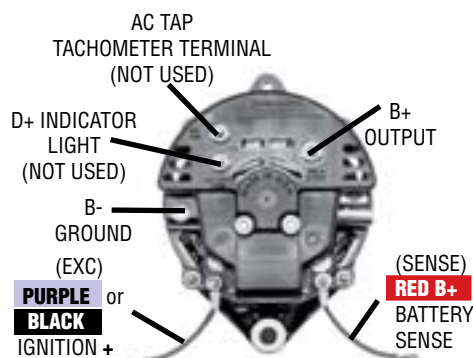


Delco style alternators use flame arrestors instead of sealed brush compartments.

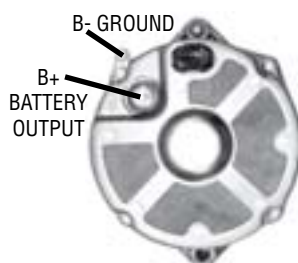
ALTERNATOR CIRCUITS

Many alternators require ignition voltage to initiate charging. You must verify that all required connections are connected to the proper terminal and have the correct voltage in order for the alternator to operate properly. Below you will find the most common alternator circuits used on marine applications.

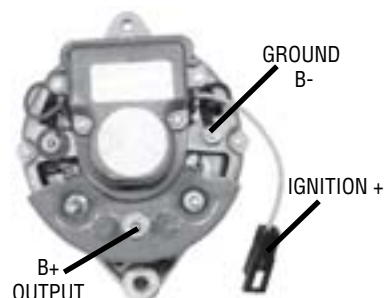
COMMON MARINE ALTERNATOR CIRCUITS



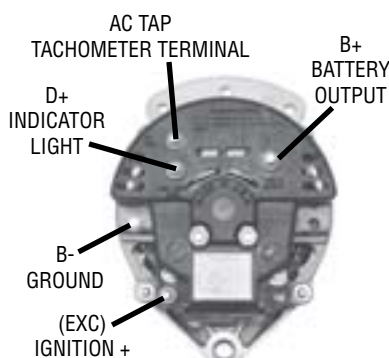
**LATE MOTOROLA/PRESTOLITE STYLE
FITS MERCUISER & OMC**



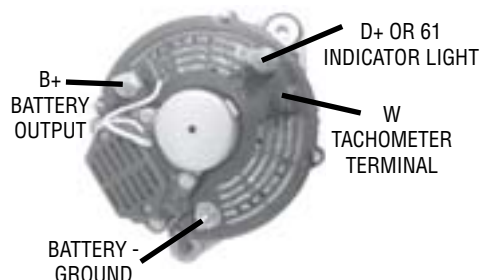
**DELCO SELF EXCITING STYLE
FITS MERCUISER AND OMC**



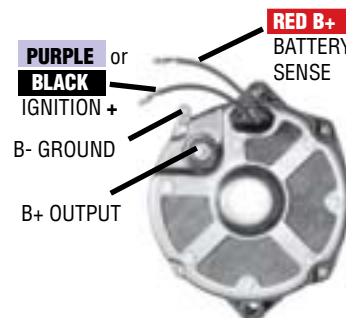
**EARLY MOTOROLA STYLE
FITS WESTERBEKE AND OTHERS**



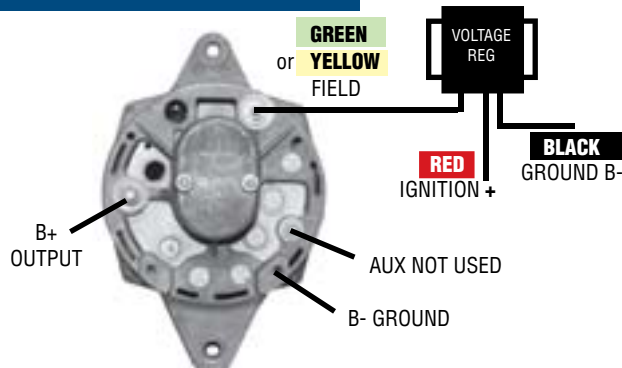
**LATE MOTOROLA/PRESTOLITE STYLE
FITS U.S. MARINE**



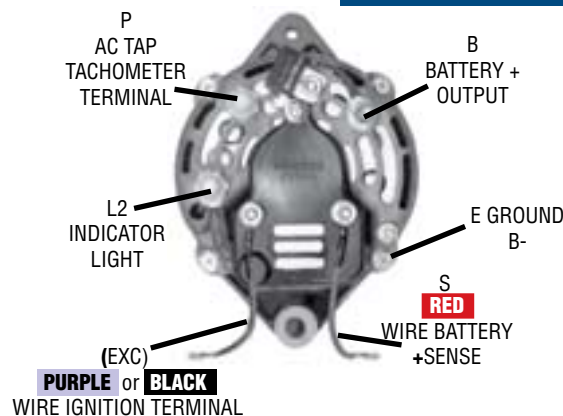
**VALEO/PARIS RHONE
FITS VOLVO PENTA**



**DELCO STYLE
FITS MERCUISER & OMC**



**EARLY PRESTOLITE STYLE
FITS OMC**



**LATE MANDO STYLE
FITS MERCUISER AND OTHERS**



REPLACEMENT INBOARD ALTERNATORS

20100

FITS: MANY DIESEL ENGINES

12 Volt, 70 AMP

Self exciting internal regulator

Negative ground

1-wire connection

2-inch mounting foot

Single groove pulley included

For high-amp (12 Volt, 105 Amp)
replacement alternator,
see 60122 on Page 56.



20102

FITS: MERCUISER, O.M.C.

12 Volt, 70 AMP

Self exciting

Ignition protection screens

Internal regulator

Negative ground

1-wire connection

2-inch mounting foot

Single groove pulley included

For high-amp (12 Volt, 105 Amp) replacement
alternator, see 60122 on Page 56.



20104

FITS: MERCUISER, O.M.C.

12 Volt, 70 AMP

Ignition protection screens

Internal regulator

Negative ground

2-wire plug

2-inch mounting foot

Single groove pulley included

For high-amp (12 Volt, 105 Amp)
replacement alternator, see
60122 on Page 56.



20500

Universal-mount alternator

12 Volt, 70 AMP

Self exciting

Ignition protection screens

1-wire connection

**Single groove
pulley included**

1-inch mounting foot

Adaptors available for
2" and 3" mounting
configurations



20800 (NEW)

FITS: MERCUISER

4.3L - 8.2L

1998-Up

12 Volt, 70 AMP

Internal Fan

65-mm multi-groove

serpentine

pulley included



20810 (NEW)

FITS: MERCUISER 3.0L

1999-UP

12 Volt, 70 AMP

Internal Fan

Single groove

pulley included



20815 (NEW)

FITS: MERCUISER 4.3L-6.2L

12 Volt, 70 AMP

Internal Fan

50-mm multi-groove

serpentine pulley

included



20820 (NEW)

**FITS: INDMAR,
PLEASURECRAFT,
CRUSADER, AND OTHERS**

12 Volt, 70 AMP

Internal Fan

2-inch mounting foot

65-mm multi-groove

serpentine pulley

included



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REPLACEMENT INBOARD ALTERNATORS



20821 (NEW)
 FITS: PLEASURECRAFT &
 MARINE POWER
 12 Volt, 70 AMP
 Internal Fan
 2-inch mounting foot
 50-mm serpentine
 pulley included



20827 (NEW)
HIGH AMP
 FITS: INDMAR
 12 Volt, 95 AMP
 Internal Fan
 2-inch mounting foot
 65-mm serpentine
 pulley included



20822 (NEW)
 FITS: PLEASURECRAFT
 12 Volt, 70 AMP
 Internal Fan
 2-inch mounting foot
 65-mm serpentine
 pulley included



20828 (NEW)
HIGH AMP
 FITS: MARINE POWER
 12 Volt, 95 AMP
 Internal Fan
 2-inch mounting foot
 Double pulley included



20825 (NEW)
 FITS: INDMAR,
 PLEASURECRAFT,
 CRUSADER, AND OTHERS
 12 Volt, 70 AMP
 Internal Fan
 2-inch mounting foot
 Single groove
 pulley included



20830 (NEW)
 FITS: MARINE POWER
 12 Volt, 70 AMP
 Internal Fan
 2-inch mounting foot
 Double pulley included
 Includes wire/plug
 connector



20826 (NEW)
HIGH AMP
 FITS: PLEASURECRAFT
 12 Volt, 95 AMP
 Internal Fan
 2-inch mounting foot
 65-mm serpentine
 pulley included



20840 (NEW)
 FITS: 2.5L
 MERCURY OUTBOARD
 12 Volt, 50 AMP
 Internal Fan
 2-inch mounting foot
 Multi-groove
 serpentine
 pulley included
 Includes wire/plug
 connector





REPLACEMENT INBOARD ALTERNATORS

20850 (NEW)

FITS: 3.0L MERCURY OUTBOARD
12 Volt, 50 AMP
Internal Fan
Multi-groove serpentine
pulley included
Includes wire/plug
connector

*Will not replace
Mercury # 821663A-1



20860 (NEW)

FITS: All Mercury
Verado Outboards
12 Volt, 70 AMP
Internal Fan
Multi-groove serpentine
pulley included



40112

FITS: CHRYSLER MARINE
12 Volt, 70 AMP
Internal regulator
Negative ground
Single groove
pulley included

VR405

Replacement Regulator
for Prestolite alternator
Not required for ARCO
replacement alternator.



Replaces this
◀ style unit



40115 (NEW)

FITS: CHRIS CRAFT
12 Volt, 55 AMP
Negative ground
1-inch mounting foot
Single groove
pulley included

VR407

Replacement Regulator
for Prestolite alternator
Not required for ARCO
replacement alternator.



Replaces this
◀ style unit



40147 (NEW)

FITS: PLEASURECRAFT, WAUKESHA
12 Volt, 55 AMP
Negative ground
2-inch mounting foot
Single groove
pulley included

VR406

Replacement Regulator
for Prestolite alternator
Not required for ARCO
replacement alternator.



Replaces this
◀ style unit



40152

FITS: O.M.C.
12 Volt, 70 AMP
Internal regulator
Negative ground
Single groove
pulley included

VR404

Replacement Regulator
for Prestolite alternator
Not required for ARCO
replacement alternator.



Replaces this
◀ style unit



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REPLACEMENT INBOARD ALTERNATORS



60050 (NEW)

MANDO
FITS: LATE MODEL
MERCUISER
12 Volt, 55 AMP
Internal regulator
2-inch mounting foot
Single groove
pulley included



M883

Replacement Regulator

65050 (NEW)

75 Amp high-output
also available

60065 (NEW)

MANDO
FITS: LATE MODEL
MERCUISER
12 Volt, 65 AMP
Internal regulator
2-inch mounting foot
Single groove
pulley included



65050 (NEW)

75 Amp high-output
also available

60055 (NEW)

MANDO
FITS: LATE MODEL
MERCUISER
12 Volt, 55 AMP
Internal regulator
2-inch mounting foot
Multi-groove serpentine
pulley included



M883

Replacement Regulator

65055 (NEW)

75 Amp high-output also available

60070 (NEW)

MANDO
FITS: LATE MODEL
VOLVO PENTA
12 Volt, 65 AMP
Internal Regulator
2-inch mounting foot
Single groove
pulley included



60071 (NEW)

MANDO
FITS: LATE MODEL
VOLVO PENTA
12 Volt, 65 AMP
Internal Regulator
2-inch mounting foot
Multi-groove serpentine
pulley included



60060 (NEW)

MANDO
FITS: LATE MODEL
MERCUISER
12 Volt, 65 AMP
Internal Regulator
2-inch mounting foot
Multi-groove serpentine
pulley included



60072 (NEW)

MANDO
FITS: LATE MODEL
VOLVO PENTA
12 Volt, 65 AMP
Multi-groove
serpentine
pulley included



65055 (NEW)

75 Amp high-output
also available

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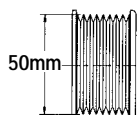




REPLACEMENT INBOARD ALTERNATORS

60073 (NEW)

VOLVO PENTA
FITS: LATE MODEL VOLVO PENTA
 12 Volt, 75 AMP
 50-mm multi-groove serpentine pulley included



60074 (NEW)

VOLVO PENTA
FITS: LATE MODEL VOLVO PENTA
 12 Volt, 75 AMP
 2-inch mounting foot
 Single groove pulley included



60075 (NEW)

UNIVERSAL ALTERNATOR W/ MANY APPLICATIONS
FITS: YAMAHA, MARINE POWER, CRUSADER
 Replaces Motorola
 12 Volt, 55 AMP
 Internal regulator Includes:
 Tachometer terminal, indicator
 light terminal, remote battery
 sensing terminal, excite terminal
 1-inch mounting foot
 with 3-ear adjustment
 Single groove pulley included

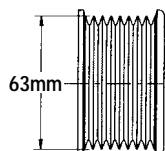


M883

Replacement Regulator

60076 (NEW)

VOLVO PENTA
FITS: LATE MODEL VOLVO PENTA
 12 Volt, 75 AMP
 63-mm multi-groove
 serpentine pulley included



60104 (NEW)

REPLACES: MOTOROLA
 12 Volt, 55 AMP
 Internal regulator
 Negative ground
 1-inch mounting foot
 Single groove
 pulley included



Replaces this
 ◀ style unit



60108 (NEW)

FITS: UNIVERSAL AND OTHERS
 12 Volt, 55 AMP
 Internal regulator
 Negative ground
 2-inch mounting foot
 Single groove
 pulley included



65108 (NEW)

75 Amp high-output
 also available



Replaces this
 ◀ style unit

60125 (NEW)

FITS: O.M.C. COBRA
 Replaces: Prestolite/Motorola
 12 Volt, 55 AMP
 Internal regulator
 Negative ground
 2-inch mounting foot
 Single groove
 pulley included



Replaces this
 ◀ style unit



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12 VOLT, 105 AMP - HIGH AMP ALTERNATORS

Today's increased electrical loads and more sophisticated electronics demand improved performance, greater reliability, and higher output from the electrical generating system. ARCO's creative engineering offers a **105 AMP** series as the means to a totally efficient electrical system. For comparison, just look at the Performance Chart at the bottom of the page!

60121 (NEW)

HIGH-AMP

12 Volt, 105 AMP

Self exciting
Integral regulator
Isolated ground
Includes: Tachometer terminal. External voltage adjustment.

1-inch mounting foot, 1/2" hole
Single groove pulley included



60126 (NEW)

HIGH-AMP

FITS: Late Model VOLVO PENTA

w/warning panel connection

12 Volt, 105 AMP

Integral regulator
Isolated ground
Includes: Tachometer terminal

2-inch mounting foot, 10mm hole
Single groove pulley included



For applications WITHOUT warning panel connection, use 60124

60122 (NEW)

HIGH-AMP

12 Volt, 105 AMP

Self exciting integral regulator
Isolated ground
Includes: Tachometer terminal.

External voltage adjustment.

2-inch mounting foot, 3/8" hole
Single groove pulley included



60498 (NEW)

HIGH-AMP

FITS: CATERPILLAR

DIESEL 6T1396

12 Volt, 105 AMP

Integral regulator
Isolated ground
Heavy duty bearings

1-inch mounting foot
PULLEY NOT INCLUDED



60124 (NEW)

HIGH-AMP

FITS: VOLVO PENTA

12 Volt, 105 AMP

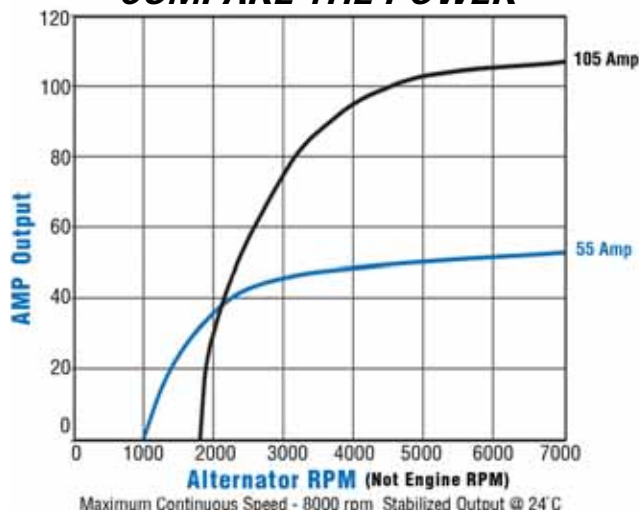
Self exciting
Integral regulator
Isolated ground
Includes: Tachometer terminal
External voltage adjustment

2-inch mounting foot, 10mm hole
Single groove pulley included



For applications WITH warning panel connection, use 60126

COMPARE THE POWER





REPLACEMENT INBOARD ALTERNATORS

60150 (NEW)

Prestolite/Motorola
24 Volt, 75 AMP
Integral regulator
Isolated ground
7" casing
PULLEY NOT INCLUDED



60160 (NEW)

Prestolite/Motorola
12 Volt, 160 AMP
Integral regulator
Isolated ground
7" casing
PULLEY NOT INCLUDED



60170 (NEW)

Prestolite/Motorola
24 Volt, 175 AMP
Integral regulator
Isolated ground
7" casing
PULLEY NOT INCLUDED



60175 (NEW)

Prestolite/Motorola
24 Volt, 100 AMP
Integral regulator
Isolated ground
7" casing
PULLEY NOT INCLUDED



60180 (NEW)

Prestolite/Motorola
32 Volt, 100 AMP
Integral regulator
Isolated ground
7" casing
PULLEY NOT INCLUDED



To be discontinued
when present stock
is exhausted

60195 (NEW)

Prestolite/Motorola
FITS: CUMMINS DIESEL
12 Volt, 65 AMP
Integral regulator
Negative ground
2-inch mounting foot
PULLEY NOT INCLUDED
Poly-V pulley
available separately



60197 (NEW)

FITS: CATERPILLAR
DIESEL 6T1395
24 Volt, 35 AMP
Integral regulator. Isolated
ground. Heavy duty bearings
1-inch mounting foot
PULLEY NOT INCLUDED



To be discontinued
when present stock
is exhausted

60198 (NEW)

FITS: CATERPILLAR DIESEL 6T1396
12 Volt, 51 AMP
Integral Regulator
Isolated ground
Heavy duty bearings
1-inch mounting foot
PULLEY NOT INCLUDED



For high-amp
(12 Volt, 105 Amp)
replacement alternator
see 60498 on Page 56.



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REPLACEMENT INBOARD ALTERNATORS



80108 (NEW)

FITS: LATE MODEL VOLVO PENTA
DIESEL ENGINES
12 Volt, 55 AMP
Internal regulator
2-inch mounting foot
PULLEY NOT INCLUDED



For high-amp
(12 Volt, 105 Amp)
replacement alternator
see 60124/60126
on Page 56.

84135

HITACHI MARINE
FITS: YANMAR DIESEL
12 Volt, 35 AMP
Internal regulator
Single groove
pulley included



80200 (NEW)

PARIS RHONE/VALEO
FITS: BAUDOUIN, BUKH,
VOLVO PENTA
DIESEL ENGINES
24 Volt, 30 AMP
Integral regulator
2-inch mounting foot
PULLEY NOT INCLUDED



To be discontinued
when present stock
is exhausted

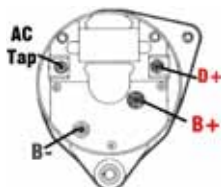
84150

HITACHI MARINE
FITS: YANMAR DIESEL
12 Volt, 50 AMP
Internal regulator
Single groove
pulley included



83160 (NEW)

FITS: LEHMAN, PERKINS, ETC.
12 Volt, 75 AMP
with regulator
Single groove
pulley included



86050

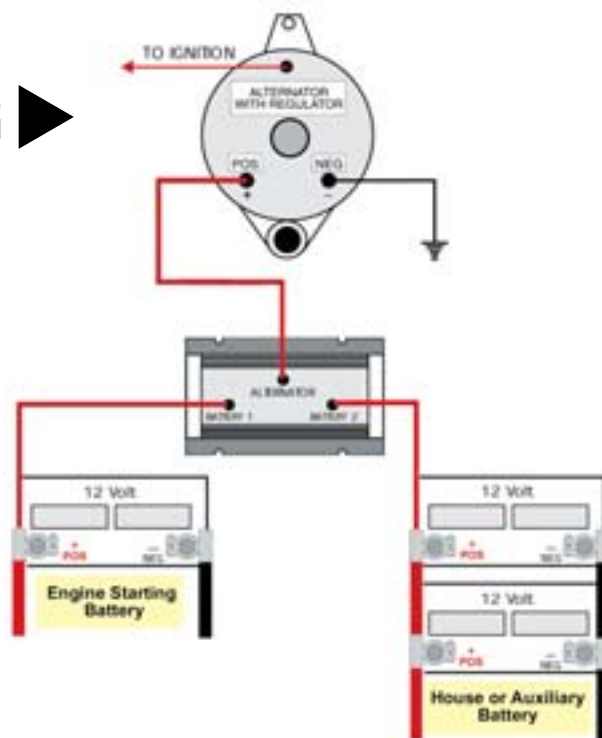
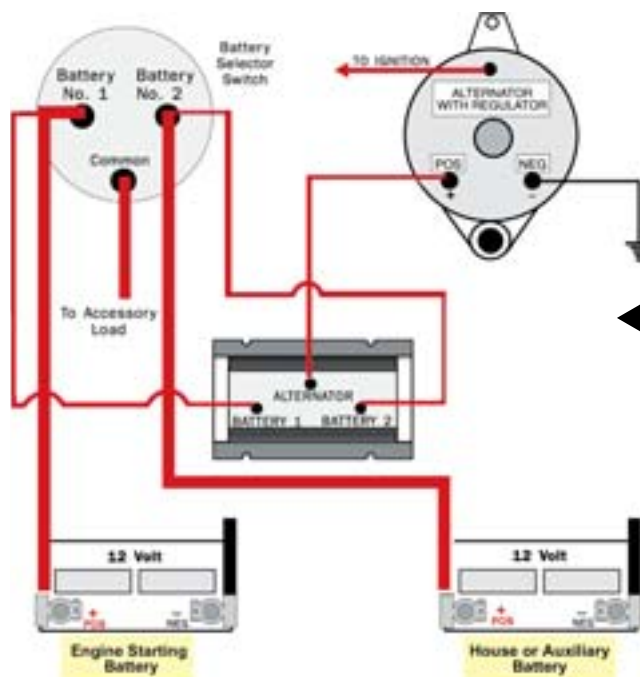
FITS: WESTERBEKE
12 Volt, 50 AMP
Internal regulator
Single groove
pulley included



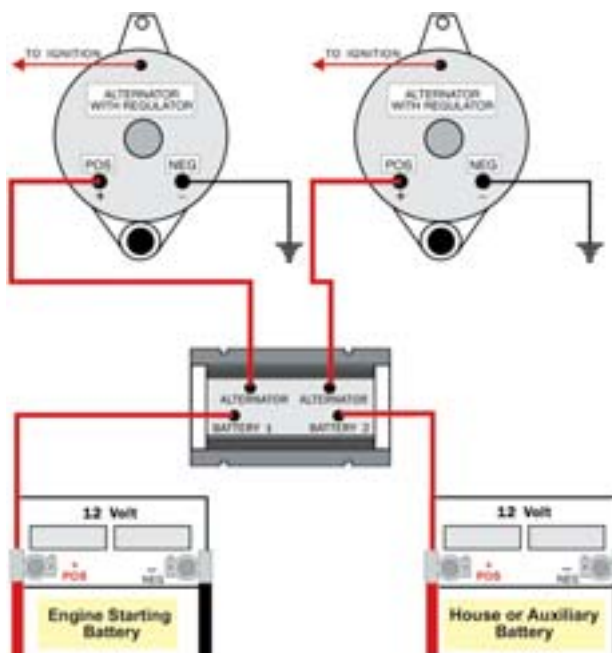
TYPICAL BATTERY ISOLATOR CIRCUITS

The most common battery isolator is the one alternator, two battery unit. It doesn't matter how many batteries are connected in parallel to the battery 1 or 2 terminal.

Remember, when batteries are connected in parallel, they become one large battery.



The one alternator, two battery isolator with a battery selector switch will allow both banks of batteries to be charged regardless of what position the battery selector switch is in.



The two alternator, two battery isolator allows both alternators to charge both batteries.

In the event of one alternator failure, both batteries would be maintained by the working alternator.

INBOARD/OUTBOARD BATTERY ISOLATORS



Battery isolators are solid-state devices which allow electrical current to flow in one direction only, thus permitting the alternator to be connected directly to two batteries without fear of one higher charged battery discharging into the lower charged battery. Both batteries are always being charged automatically, in proportion, to their needs, whenever the engine is running. When battery isolators are used in conjunction with selector switches, it is not necessary to change the switch position to provide for charging of both batteries. Isolators provide proportioning of the output or charging current on the alternator to the batteries as required, regardless of switch position. Rated for use with 10 to 350 amp alternators on 12, 24, or 32 volt negative ground systems.

Note *Battery Isolators cannot be used on 12 volt charging systems with 24 volt trolling motors or newer outboard engines with rectifier-regulator charging systems.*

BI-0702

1 Alternator, 2 Batteries
70 AMP max



BI-1202-3A

1 Alternator,
2 Batteries
120 AMP max
Includes: Exciter Terminal



BI-0702-4

1 Alternator, 2 Batteries
70 AMP max
Includes: Regulator
sensing terminal



BI-1203

1 Alternator,
3 Batteries
120 AMP max



BI-0703

1 Alternator, 3 Batteries
70 AMP max



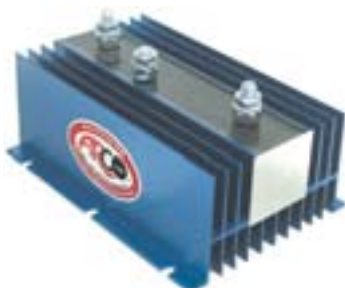
BI-1203-3A

1 Alternator,
3 Batteries
120 AMP max
Includes Exciter Terminal



BI-1202

1 Alternator,
2 Batteries
120 AMP max



BI-1602

1 Alternator,
2 Batteries
160 AMP max





INBOARD/OUTBOARD BATTERY ISOLATORS

Note Battery Isolators cannot be used on 12 volt charging systems with 24 volt trolling motors or newer outboard engines with rectifier-regulator charging systems.

BI-1603

1 Alternator,
3 Batteries
160 AMP max



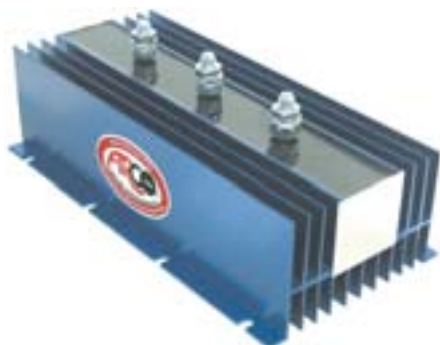
BI-2703-4

2 Alternators,
3 Batteries
70 AMP max
Includes: Regulator
sensing terminal



BI-2402

1 Alternator,
2 Batteries
240 AMP max



BI-3202

2 Alternators,
2 Batteries
120 AMP max



BI-2702

2 Alternators,
2 Batteries
70 AMP max



BI-3203

2 Alternators,
3 Batteries
120 AMP max



BI-2703

2 Alternators,
3 Batteries
70 AMP max



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WIRING

Wiring is just as important as any other component in the starting and charging system. It must be capable of delivering the amount of current that the load is demanding.

When electrical systems are designed, the wire size is calculated for the specific requirements of the electrical components being used. **When electrical components are added or upgraded, the wire size has to be upgraded also. For example, replacing a low torque starter with a high torque starter will normally require the battery cables and possibly the battery to be upgraded. WHEN IN DOUBT, ALWAYS USE A BIGGER WIRE.**

A word about wire gauge

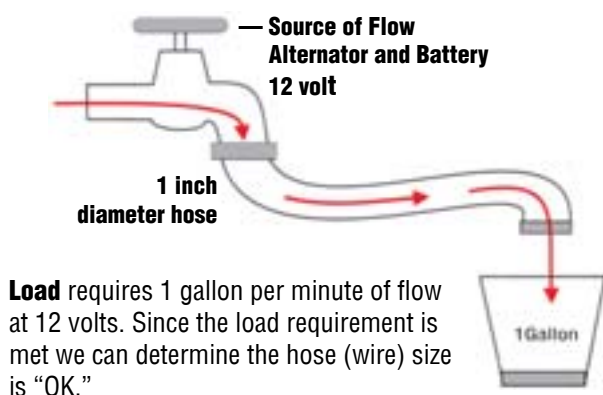
The size of a wire (gauge) is expressed in terms of a standard American Wire Gauge (AWG) measurement.

The higher the AWG number, the smaller the wire. For example, a 14 gauge wire is smaller than a 10 gauge wire. The smaller the wire, the greater its resistance to the flow of electrons and the greater the heat generated when the wire is conducting electricity. The heat can destroy insulation and even kindle a fire. **THE LARGER THE AMPERAGE OF A CIRCUIT, THE LARGER THE WIRE THAT IS NEEDED.**

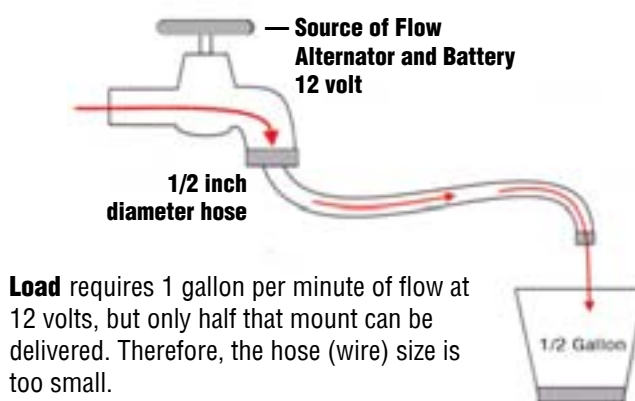
Think of wiring as a water hose.

The electrical current is like water flowing through the hose. The source or supply of this water would be the battery and alternator. Look at the diagrams below. The first diagram shows a one inch diameter hose which allows one gallon per minute of flow. Since the load requires only a gallon per minute of flow, we can say that this hose (wire size) is of sufficient size to carry the supply of water (current) to the load. This all changes when we reduce the water hose (wire size) to one half inch as shown in the second diagram. The hose (wire) can only deliver half the current needed by the load— this hose (wire) is NOT of sufficient size to carry the needed supply of water (current) to the load.

Adequate Wire Size (gauge)



Inadequate Wire Size (gauge)



BIGGER (LARGER) IS BETTER!

The higher the AWG Number, the smaller the wire.

The larger the amperage of a circuit, the larger the wire that is needed.

WIRING AND VOLTAGE

VOLTAGE IS MUCH LIKE WATER PRESSURE.

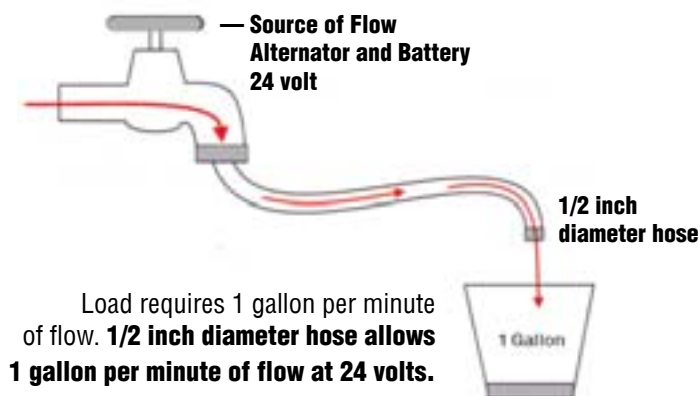
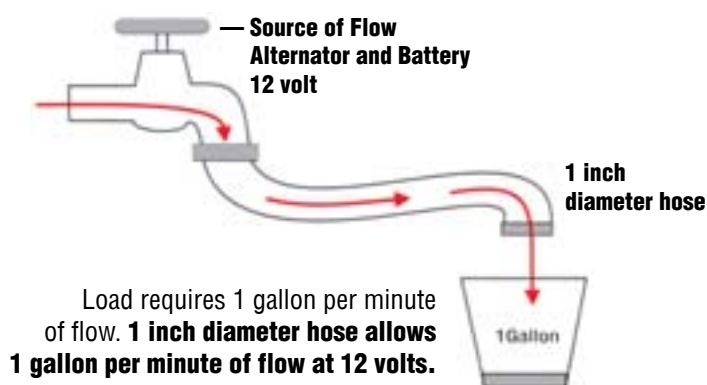
When calculating proper wire sizing, voltage plays a very important role.

Voltage is much like water pressure. The higher the voltage, the faster the current flows.

A 24 volt system can move the same amount of current through a wire one half the size required for a 12 volt system.

This is also shown in the charging cable size chart on the following page.

Notice that the 24 volt cable size requirements are much less than that of the 12 volt.



The higher the voltage, the faster the current flows.

RECOMMENDED WIRE SIZES

Below you will find the recommended wire sizes for charging and starting systems. **IT IS VERY IMPORTANT TO INCLUDE THE GROUND CABLE WHEN CALCULATING THE TOTAL LENGTH OF THE SYSTEM.**

The ground cable must carry the same amount of current as the positive cable.

WHEN IN DOUBT - - - BIGGER IS BETTER!

MINIMUM CHARGING CABLE GAUGE SIZE

| TYPE OF SYSTEM | OUTPUT IN AMPERES | TOTAL LENGTH INCLUDING GROUND CABLE | | | | | | | |
|----------------|-------------------|-------------------------------------|----------------|-----------------|------------------|------------------|------------------|------------------|------------------|
| | | UP TO 4 FT. | 4 FT. TO 7 FT. | 7 FT. TO 10 FT. | 10 FT. TO 13 FT. | 13 FT. TO 16 FT. | 16 FT. TO 19 FT. | 19 FT. TO 22 FT. | 22 FT. TO 28 FT. |
| 12 VOLT | 0-20 AMPS | 14 GA. | 12 GA. | 12 GA. | 10 GA. | 10 GA. | 8 GA. | 8 GA. | 8 GA. |
| | 20-35 AMPS | 12 GA. | 10 GA. | 8 GA. | 8 GA. | 6 GA. | 6 GA. | 6 GA. | 4 GA. |
| | 35-50 AMPS | 10 GA. | 8 GA. | 8 GA. | 6 GA. | 6 GA. | 4 GA. | 4 GA. | 4 GA. |
| | 50-65 AMPS | 8 GA. | 8 GA. | 6 GA. | 4 GA. | 4 GA. | 4 GA. | 4 GA. | 4 GA. |
| | 65-85 AMPS | 6 GA. | 6 GA. | 4 GA. | 4 GA. | 2 GA. | 2 GA. | 2 GA. | 0 GA. |
| | 85-105 AMPS | 6 GA. | 6 GA. | 4 GA. | 2 GA. | 2 GA. | 2 GA. | 2 GA. | 0 GA. |
| | 105-125 AMPS | 4 GA. | 4 GA. | 4 GA. | 2 GA. | 2 GA. | 0 GA. | 0 GA. | 0 GA. |
| | 125-150 AMPS | 2 GA. | 2 GA. | 2 GA. | 2 GA. | 0 GA. | 0 GA. | 0 GA. | 00 GA. |
| 24 VOLT | 0-20 AMPS | 14 GA. | 14 GA. | 14 GA. | 12 GA. | 12 GA. | 12 GA. | 10 GA. | 10 GA. |
| | 20-35 AMPS | 12 GA. | 12 GA. | 12 GA. | 10 GA. | 10 GA. | 8 GA. | 8 GA. | 8 GA. |
| | 35-50 AMPS | 10 GA. | 10 GA. | 10 GA. | 10 GA. | 6 GA. | 6 GA. | 6 GA. | 6 GA. |
| | 50-65 AMPS | 8 GA. | 8 GA. | 8 GA. | 8 GA. | 6 GA. | 4 GA. | 4 GA. | 4 GA. |
| | 65-85 AMPS | 6 GA. | 6 GA. | 6 GA. | 6 GA. | 6 GA. | 6 GA. | 4 GA. | 4 GA. |
| | 85-105 AMPS | 6 GA. | 6 GA. | 6 GA. | 6 GA. | 4 GA. | 4 GA. | 4 GA. | 2 GA. |
| | 105-125 AMPS | 4 GA. | 4 GA. | 4 GA. | 4 GA. | 4 GA. | 4 GA. | 2 GA. | 2 GA. |
| | 125-150 AMPS | 2 GA. | 2 GA. | 2 GA. | 2 GA. | 2 GA. | 2 GA. | 2 GA. | 2 GA. |

MINIMUM STARTING CABLE GAUGE SIZE FOR MOST INBOARD GASOLINE ENGINE APPLICATIONS

| 4 - 6 - 8 Cylinder Gasoline Engine | | | | | | | |
|---|-----------|------------|-----------|-----------|-----------|-----------|-----------|
| Total Cranking Circuit Length in Inches | UP TO 75" | 75" - 125" | 125"-175" | 175"-225" | 225"-275" | 275"-325" | 325"-425" |
| Minimum Battery Cable Size | 4 | 2 | 1 | 0 | 2/0 | 3/0 | 4/0 |

SOLENOID TYPES AND CIRCUITS

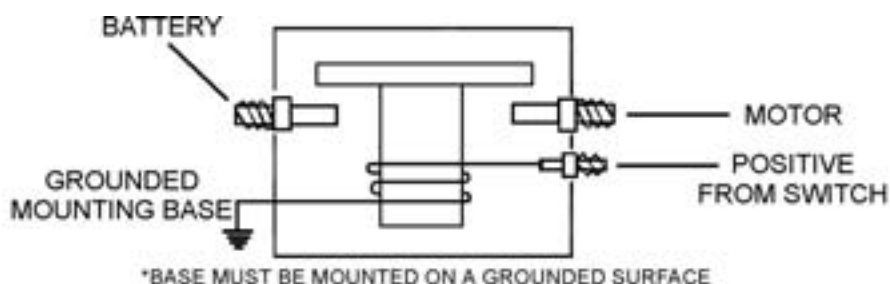


Many of the remote mount solenoids look identical on the outside.

However, they can be very different on the inside. Beside the different internal circuits, these can be rated for continuous duty or intermittent duty use.

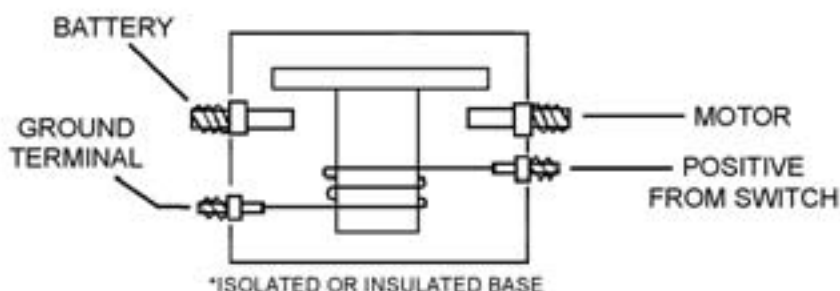
Continuous duty solenoids are wound with very fine wire and draw very little amperage. The contacts in continuous duty solenoids will usually have a lower amperage rating than that of the intermittent duty type. These are normally used as tilt trim relays. This type of solenoid can also be used for a variety of applications where a remote relay is needed to power a motor or other device.

Intermittent duty solenoids are wound with much heavier wire and draw more amperage. The contacts have a very high amperage rating. If these stay energized for extended periods of time they heat up and eventually burn out the coil inside the solenoid. This type of solenoid is normally used as a starter motor relay.



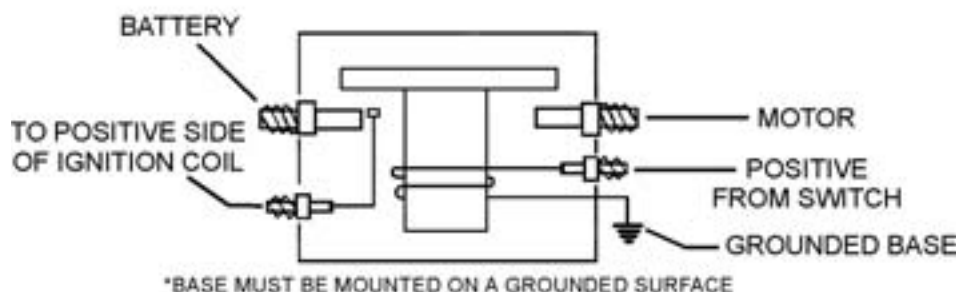
GROUND BASE SOLENOIDS

One end of the coil is grounded to the mounting base. This type solenoid must mount on a grounded surface or a ground must be attached to the base.



INSULATED BASE SOLENOIDS

Both ends of the coil in this unit are insulated. A separate ground must be connected and this type of solenoid can be mounted on any surface.

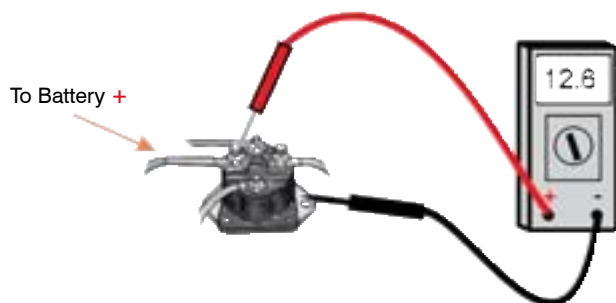


SOLENOIDS EQUIPPED WITH RELAY TERMINAL

This type of solenoid is normally used for starting motors. Since conventional ignition coils operate on 7 volts, the relay terminal supplies 12 volts to the ignition coil during starting for easier starts. The base of this solenoid must be grounded.

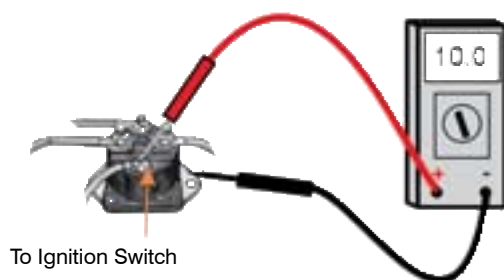
SIMPLE SOLENOID TESTING: GROUNDED BASE REMOTE SOLENOIDS

NOTE: Before Performing These Tests You Must Fully Charge and Load Test The Battery to Verify It Is Good.

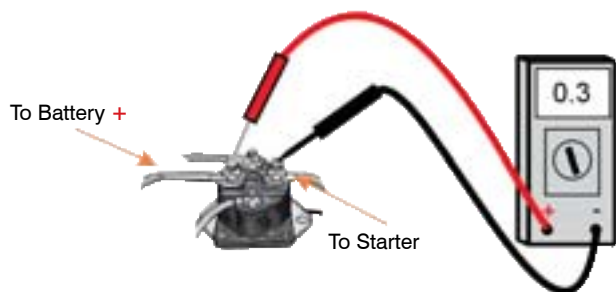


Step 1: Check the voltage on the battery side of the solenoid as shown on the left. The reading should be the same as the battery reading (12.6V = Full Charged Battery).

Step 2: With the voltmeter still connected, turn the key to the start position and read the voltage. The voltage should not drop below 10.0 volts on this terminal. If the voltage drops below 10.0 volts, The battery cable should be cleaned or replaced. If the reading is 10.0 volts or more move on to step 3.



Step 3: Keep the negative voltmeter lead on the metal base of the solenoid and move the positive voltmeter lead to the terminal marked "S" on the solenoid. Turn the key to the start position and read the voltage. The Voltage could read a little lower than the previous reading but should never be below 10.0 volts. If the voltage is lower than 10.0 volts, You must troubleshoot the start circuit (ignition switch, voltage supply to the ignition switch, neutral safety switch).



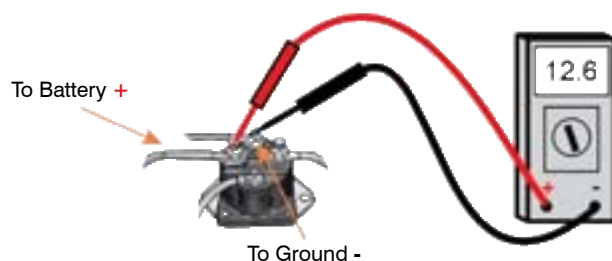
Step 4: Move the positive voltmeter lead to the battery terminal on the solenoid and the negative voltmeter lead to the terminal that the starter cable is attached. Turn the key to the start position and read the voltage. The voltage should read no more than .3 volts. If the reading is more than .3 volts the contacts have excessive resistance and the solenoid should be replaced.



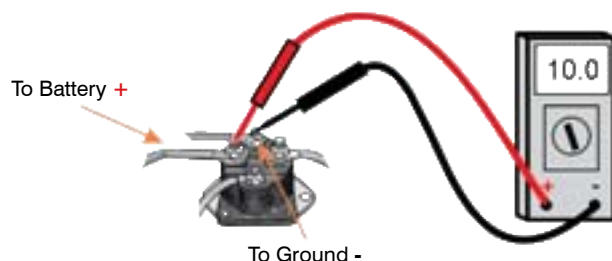
Step 5: Some solenoids use a relay terminal on the solenoid to power fuel pumps or supply full battery voltage to ignition coils when the starter is activated. This terminal is usually marked "I" or "R". Connect the voltmeter as shown. Turn the key to the start position. You should read no more than 0.3 volts. If you have more than 0.3 volts the solenoid should be replaced.

SIMPLE SOLENOID TESTING: **INSULATED BASE** REMOTE SOLENOIDS

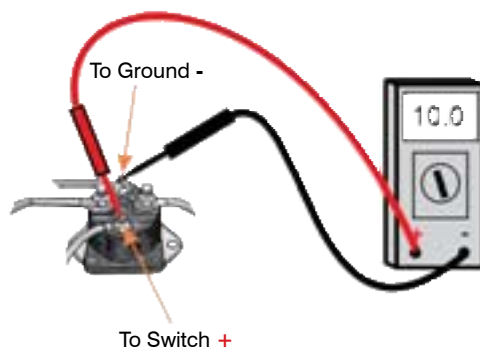
NOTE: Before Performing These Tests You Must Fully Charge and Load Test The Battery to Verify It Is Good.



Step 1: Check the voltage on the battery side of the solenoid as shown on the left. The reading should be the same as the battery reading (12.6V = Full Charged Battery).



Step 2: With the voltmeter still connected, activate the switch and read the voltage. The voltage should not drop below 10.0 volts on this terminal. If the voltage drops below 10.0 volts, the battery cable should be cleaned or replaced. If the reading is 10.0 volts or more move on to step 3.



Step 3: Keep the negative voltmeter lead on the ground terminal of the solenoid and move the positive voltmeter lead to the terminal marked "S" on the solenoid. Activate the switch and read the voltage. The Voltage could read a little lower than the previous reading but should never be below 10.0 volts. If the voltage is lower than 10.0 volts, you must troubleshoot the switch circuit (toggle switch, push button switch, or voltage supply to these switches).



Step 4: Move the positive voltmeter lead to the battery terminal on the solenoid and the negative voltmeter lead to the terminal that the starter cable is attached. Activate the switch and read the voltage. The voltage should read no more than .3 volts. If the reading is more than .3 volts the contacts have excessive resistance and the solenoid be replaced.

REPLACEMENT SOLENOIDS



SW054

FITS: MERCUISER, MERCURY
Isolated base
12 Volt



SW058

STANDARD-DUTY
FITS: MERCUISER, MERCURY
Isolated base
12 Volt



SW058HD

HEAVY-DUTY
FITS: MERCUISER, MERCURY
Isolated base
12 Volt



High Temp Housing
for Less Distortion

Studs are Molded
in the Housing for
More Precise
Contacting

One Piece
Moving Core
with Solid
Brass Stem

Heavy Duty
High Temp
Coil Assembly

Solid Copper
Moving Contact
Covers Stud
Contacts for More
Contact Area

SW064

FITS: MERCUISER, MERCURY
Isolated base
12 Volt
White housing



SW081

FITS: MANY APPLICATIONS; O.M.C.
Isolated base
12 Volt



SW097

FITS: MERCUISER, MERCURY
Isolated base
12 Volt
White housing



SW099

FITS: MERCUISER, MERCURY & YAMAHA 4 STROKE
Isolated base
12 Volt



SW109

FITS: MERCURY/FORCE
Isolated base
12 Volt





REPLACEMENT SOLENOIDS

SW125

HEAVY-DUTY

FITS: FORD

ARCO 70125, 70200,

70201, 70212, 70216

gear reduction starters

on late model 5.0L, 5.8L



SW225

HEAVY-DUTY

FITS: VOLVO PENTA,

VALEO gear reduction



SW268

FITS: O.M.C.

Grounded base

12 Volt



SW275

FITS: MERCURY

Isolated base

12 Volt



SW288

FITS: O.M.C.

Isolated base

12 Volt



SW295

FITS: CHRYSLER

Isolated base

12 Volt



SW340

FITS: O.M.C.

Isolated base

12 Volt



SW394

FITS: MERCURISER & O.M.C.

Grounded base

12 Volt



SW450

FITS: ARCO 30460, 30470

4 terminals

12 Volt

Plungers to fit these units

MUST BE ORDERED

SEPARATELY-SEE BELOW



PA450L

2 1/4" Plunger for

ARCO SW450



Fits late model 30470.

PA450S

1 3/4" Plunger for

ARCO SW450



Will also fit early model 30450 & all 30460.



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REPLACEMENT SOLENOIDS



SW456

FITS: 14 MT
ARCO 30456, 30457
 4 Post, 3-Bolt Mount



SW463

HEAVY-DUTY
FITS: O.E. DELCO PG 260,
MERCUISER, OMC, VOLVO PENTA
 This solenoid will not fit
ARCO 30460, 30470!



SW486

FITS: MANY HITACHI STARTERS
on YANMAR diesels
 12 Volt



SW565

FITS: VOLVO PENTA
 Isolated base
 12 Volt



SW580

FITS O.M.C.
1993-UP,
9.9 -15 HP Outboard
 Isolated base
 12 Volt



SW590

Starter Solenoid
FITS: LATE MODEL
EVINRUDE E-TEC ENGINES
 Isolated base



SW595

FITS EVINRUDE E-TEC
2010-UP 15 HP-300 HP



SW622

FITS O.M.C.
 Isolated base
 12 Volt



SW661

FITS: MERCURY
 Isolated base
 12 Volt



SW730

FITS: O.M.C.
 Grounded base
 12 Volt



SW774

FITS: CHRYSLER, O.M.C.
 Replaces Chrysler 177917
 Grounded base
 12 Volt





REPLACEMENT SOLENOIDS

SW814

FITS: PARIS RHONE
D11E167T, ETC.
12 Volt



SW865

HEAVY-DUTY
12 VOLT, 1000 AMP
Parallel/solenoid
Isolated ground



SW866

24 VOLT, 1000 AMP

SW924

FITS: FORCE OUTBOARDS
Choke solenoid
Order plunger (below) separately



PA924

Plunger to fit ARCO SW924

SW925

FITS: MERCURY OUTBOARDS
Choke solenoid



SW926

FITS: 75 HP-V200 HP
MERCURY OUTBOARDS
Choke solenoid



SW941

FITS: YAMAHA
Solenoid



SW945

FITS: YAMAHA 2 & 4 STROKE,
MERCURY 4 STROKE
Starter solenoid



SW950

FITS: YAMAHA
Solenoid



SW975

FITS: DELCO
Standard solenoid
12 Volt



SW981

FITS: MERCURY
Grounded base
12 Volt



SW984

FITS: DELCO
Metric solenoid
12 Volt



AR103

FITS: O.M.C.
3-lead Rectifier



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OUTBOARD RECTIFIERS & REPLACEMENT RELAYS



AR104

FITS: O.M.C.
4-lead Rectifier



AR351

HEAVY-DUTY
FITS: MERCURY
3-post Rectifier



R012 Continuous duty relay;
12 Volt, 85 Amp



R024 24 Volt, 85 Amp

R036 32-36 Volt, 85 Amp

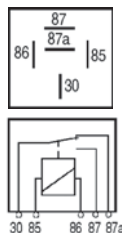
R038

S.P.D.T. normally closed,
continuous duty relay
used w/many winch motors
Isolated ground, 12 Volt, 85 Amp



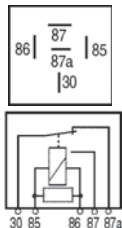
R040

FITS: VOLVO PENTA
12 Volt, 30 Amp



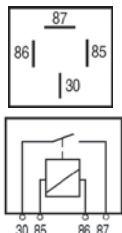
R151

FITS: MERCURY &
MARINER OUTBOARDS
12 Volt, 30 Amp



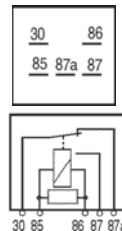
R177

FITS: VOLVO PENTA
12 Volt, 30 Amp



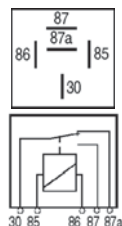
R202

FITS: MERCURISER
12 Volt, 30 Amp



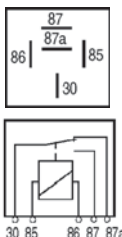
R211

FITS: MERCURY
12 Volt, 30 Amp



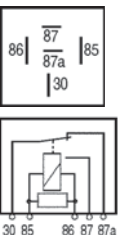
R473

FITS: O.M.C.
12 Volt, 30 Amp



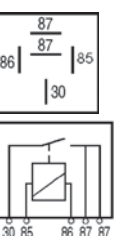
R509

FITS: MERCURY,
MARINER & FORCE,
OUTBOARDS
12 Volt, 30 Amp



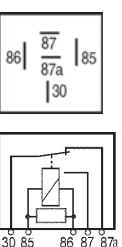
R670

FITS: VOLVO PENTA
12 Volt, 30 Amp



R751

FITS: MERCURISER &
MERCURY VERADO
OUTBOARDS
12 Volt, 30 Amp





REPLACEMENT RELAYS & VOLTAGE REGULATORS

R767

EVINRUDE E-TEC

O/B TILT/TRIM RELAY

REPLACES EVINRUDE 0586767

2011-2012 E-TEC 25, 30, 40,
50, 60, 75, 90, 115, 130, 150,
175, 200, 225, 250, 300

2008-2010 E-TEC 30, 40, 50,
60, 75, 90, 115, 130, 150, 175,
200, 225, 250, 300

2007 E-TEC 40, 50, 60, 75, 90,
115, 150, 175, 200, 225, 250

2006 E-TEC 40, 50, 60, 75, 90, 200, 225, 250

2005 E-TEC 40, 50, 75, 90, 200, 225, 250

2004 E-TEC 40, 50, 75, 90



R809

VOLVO PENTA

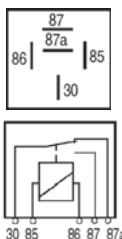
REPLACES: VOLVO

PENTA 3858081,
3858809

1998 SX-M-MAC,
MDA, MLT), 3.0GLP-
D, 4.3GL-E, 4.3GL-EF,
4.3GXi-F, 4.3GXi-FF,
4.3OSi-F, 4.3OSi-FF,

5.0GL-F, 5.0GL-FF, 5.0GXi-F, 5.0GXi-FF, 5.0Si-F, 5.0Si-FF, 5.7Gi-
F/FF, 5.7GXi-G/GF, 5.7OSi-E/EF, 5.7OXi-E/EF, 5.7GiL-F, 5.7GXi-G,
8.1Gi-G/GF, 8.1GXi-F/FF, 8.1OSi-C/CF, 8.1GiL-G, 8.1GXii-F, DPH-A,
DPH-B, DPR-A, DPH-B, EF drives, SX-M TSKs

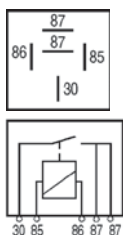
1998-2005 SX-M, DP-SM, (WT drives, PJX-C, PJX-S SX-M, -MA-
CLT, -MDA, -MDB, -MHP, -MTD, DP-E, DP-S, -S1, -S2, DP-SM,
-SM) XDP-B, O.M.C. COBRAS WITH TELEFLEX PUMPS



R832

FITS: VOLVO PENTA

12 Volt, 30 Amp



R950

YAMAHA O/B TILT/TRIM RELAY

REPLACES: YAMAHA 6E5 81950-01

1991 & Up 115 HP,

1991 - 2004 130 HP,

1991 & Up 150 HP,

1991 - 2000 175 HP,

1991 - 1999 200 HP

SUZUKI 38410-94540



R951

YAMAHA O/B TILT/TRIM RELAY

REPLACES: YAMAHA 6E5 8195A-01

1991 & Up 115 HP,

1991 - 2004 130 HP,

1991 & Up 150 HP,

1991 - 2000 175 HP,

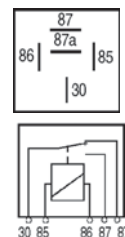
1991 - 1999 200 HP



R952

FITS: VOLVO PENTA

12 Volt, 30 Amp



VR095

LATE MODEL S.E.V. MARCHAL,

REPLACES: VOLVO PENTA 841688-5

Plastic case, 12 Volt



VR404

PRESTOLITE MARINE

REPLACES: O.M.C. 383440

12 Volt



VR405

PRESTOLITE MARINE

FITS: CRUSADER, PALMER,

UNIVERSAL, ETC.

REPLACES: CHRYSLER 2847527

12 Volt



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VR406

PRESTOLITE MARINE
REPLACES: PLEASURECRAFT
 RO98002, etc.
 12 Volt



VR407

PRESTOLITE MARINE
FITS: OWENS YACHT, ETC.
REPLACES: CHRIS CRAFT
 16.60-00031
 12 Volt



VR512

FITS: PARIS RHONE/VALEO
 A13N147M, A13N148M
LATE MODEL VOLVO PENTA
 858840
 12 Volt



M883

Regulator assembly
FITS: LATE MODEL MANDO
REPLACES MERCURISER 811883



BH450

Brush Holder Assembly
FITS: ARCO 30460, 30470
 High performance starters



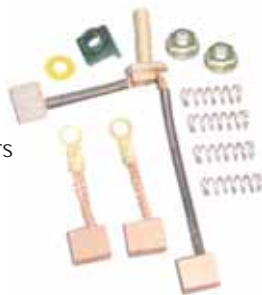
BK899

Replacement brushes
FITS: Most HITACHI jet ski,
 small outboard and
 snowmobile starters



BK900

Replacement brushes
FITS: AMERICAN-MADE
 permanent magnet outboard starters



DV225

FITS: VALEO starter nos. D9R116, D9R144
 used on **VOLVO PENTA** diesel engines,
ARCO starter No. 97225



DV450

CW Rotation, 11 tooth gear
FITS: ARCO High Performance
 Gear Reduction Starter 30470



DV456

FITS: DELCO 14MT, ARCO 30456
 Starters w/CW Rotation
 9-tooth gear



DV457

FITS: DELCO 14MT, ARCO 30457
 Starters w/CCW Rotation
 9-tooth gear



DV460

FITS: High Performance
ARCO 30460 Gear Reduction Starter
 CW Rotation, 9 tooth gear





MISCELLANEOUS ITEMS

M525

Reservoir kit
FITS: ARCO 6275
 Replaces: MERCURISER
 Includes: Reservoir, cap, O-rings, mounting screw



M531

Reservoir kit
FITS: ARCO 6227
 Replaces: Volvo
 Includes: Reservoir, cap, O-rings



M532

Fits MERCURISER 883166A2

M533

Fits VOLVO-PENTA 3858077
 New style reservoir kit, heavy duty 4-screw mount. Improved design, will only fit late model OILDYNE pumps equipped with 4 mounting ears.
Includes: Reservoir, screws, cap, O-rings.



MBK450

Mounting bolt kit for gear reduction starters
FITS: ARCO 30470 starter,
 2 long mounting bolts, 3/8"-16 N.C. threads
 This kit will also fit all DELCO gear reduction starters w/staggered bolt mounting pattern



Required when replacing a 10MT Starter with a Gear Reduction Starter.
Will NOT FIT metric engines or 10MT starters.

MBK460

Mounting bolt kit
FITS: ARCO 30460 starter,
 3/8"-16 N.C. threads
 This kit will also fit DELCO 10MT style starters w/1 short & 1 long mounting bolt



Will NOT FIT metric engines

PA450S

1 3/4" Plunger for ARCO SW450
Fits 30460



PA450L

2 1/4" Plunger for ARCO SW450
Fits 30470



PA924

Plunger to fit ARCO SW924
 Replaces: Force 839126-1



SR102

Prestolite repair kit
FITS: PRESTOLITE
 2-brush outboard starters



SR104

Prestolite repair kit
FITS: PRESTOLITE
 4-brush outboard starters



SR107

ARCO BRUSH LOADING TOOL

Makes brush loading as simple as 1-2-3
 Perfect tool for loading outboard starter brushes.
 Fits most all size and shape caps.



TM001

Electrical Technical Manual

This easy-to-understand technical reference is written by Mechanics for Mechanics. Procedures are explained in basic terms with illustrated examples.



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MISCELLANEOUS ITEMS



TAK217

Screws, O-ring, and adapter for tilt/trim motors

FITS: **ARCO** 6217, PRESTOLITE ERH4102



TAK247

Mounting bolts, flat washers, O-ring and couplers for tilt/trim motors

FITS: **ARCO** 6247 & 6248



TAK276

Mounting bolts, O-ring, fill cap and shaft adapters for tilt/trim motors

FITS: **ARCO** 6274 & 6276



WH800

Wire connector.

Fits **ARCO** alternators

20800, 20810, 20815, 20840, 20850, 65050 & 65055



WH826

Wire connector.

Fits **ARCO** alternators

20826, 20827 & 20828



WH830

Wire connector.

Fits **ARCO** alternators

20820, 20821, 20822, 20825 & 20830
60073, 60074 & 60076



DV1000

HEAVY-DUTY

Idler gear assembly

Sea-Doo, PWC 951cc



DV440

HEAVY-DUTY Replacement drive gear

FITS: KAWASAKI PWC 440 - 550cc



DK440

Drive spring /retainer kit



DV500

HEAVY-DUTY Replacement drive gear

FITS: YAMAHA PWC 500cc



DK500

Drive spring/retainer kit



DV750

HEAVY-DUTY Idler gear assembly

FITS: KAWASAKI 650, 750, 900cc



DV744

HEAVY-DUTY Idler gear assembly

FITS: POLARIS PWC 650-750cc



DV700

HEAVY-DUTY Idler gear assembly

FITS: YAMAHA PWC 650, 701, 760cc



DV650

HEAVY-DUTY Replacement drive gear

FITS: SEA-DOO PWC 580, 650, 720cc

9-tooth drive gear



DK580

Drive spring/retainer kit





We build.



**We test.
And test.
And test.**



We ship.

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